ACS-2048

User's Guide

- Manual #: 26-0603000-00
- Revision: 01

Visibly yours

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Operators Safety Summary

The general safety information in this summary is for operating personnel.

Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

Terms In This Manual and Equipment Marking

WARNING

Highlights an operating procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

Note

Highlights an essential operating procedure, condition or statement.

CAUTION

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

AVERTISSEMENT!

Le point d´exclamation dans un triangle equilatéral signale à alerter l´utilisateur qu´il y a des instructions d´operation et d´entretien tres importantes dans la litérature qui accompagne l´appareil.

VORSICHT

Ein Ausrufungszeichen innerhalb eines gleichwinkeligen Dreiecks dient dazu, den Benutzer auf wichtige Bedienungs-und Wartungsanweisungen in der Dem Great beiliegenden Literatur aufmerksam zu machen.

Change History

The table below lists the changes to the ACS-2048 User's Guide.

Table 0-1. Change History

Rev	Date	ECP #	Description	Approved By
01	9/6/07	549078	ACS-2048 User's Guide	R. Pellicano

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1. Introduction

In This Chapter

This chapter is designed to introduce you to the ACS-2048 User's Guide. Areas to be covered are:

- **Chapter Structure**
- **How to Use This Guide**
- **Conventions**
- **About the ACS-2048**
- **Connectivity Diagram**
- **Application Questions**

Chapter Structure

The following chapters provide instructions for all aspects of ACS-2048 operations:

- Chapter 1, "**Introduction**" provides a system overview, a list of features, and a system connectivity diagram.
- Chapter 2, "**Hardware Orientation**" on page 17 provides detailed diagrams of the system's front and rear panels.
- Chapter 3, "**Installation**" on page 25 provides comprehensive system installation instructions.
- Chapter 4, "**Operation**" on page 31 provides menu tress, plus comprehensive system operating instructions.
- Chapter 5, "**Upgrading Software**" on page 73 outlines procedures for upgrading system software components.
- Appendix A, "**Specifications**" on page 81 lists the ACS-2048's specifications.
- Appendix B, "**Remote Control Protocol**" on page 93 provides information regarding remote control protocol.
- Appendix C, "**Contact Information**" on page 107 lists important Barco contact, RMA, warranty and technical support details.

How to Use This Guide

This section provides important tips for streamlining your use of this User's Guide in its electronic "PDF" form.

Navigating

Use Acrobat Reader's "bookmarks" to navigate to the desired location. All chapter files have the same bookmark structure for instant navigation to any section. Please note:

- Extensive hyperlinks are provided within the chapters.
- Use Acrobat's "**Go to Previous View**" and "**Return to Next View**" buttons to trace your complete navigational path.
- Use the "**Previous Page**" and "**Next Page**" buttons to go to the previous or next page within a file.
- Use Acrobat's extensive search capabilities, such as the "**Find**" tool and "**Search Index**" tool to perform comprehensive searches as required.

Table of Contents and Index

Use the **Table of Contents** bookmarks to navigate a desired topic. Click any item to instantly jump to that section of the guide. You can also use the **Index** to jump to specific topics within a chapter. Each page number in the **Index** is a hyperlink.\

Conventions

The following conventions are used throughout this guide:

- The symbol ■ denotes an operations procedure.
- The symbol ▲ denotes an example.
- Entries written in bold-face capital letters denote physical buttons or chassis connectors.

  ▲ Press **TEST PAT** to ...
- The term "**select**" is used as an abbreviation for "scroll to a selected menu line and press the **SEL** button."
- A sequence of menu steps is represented by the menu names, separated by arrows (**>**).

  ▲ **INPUT > Timing Adjust > H Position**

  ... indicates the following sequence:

  a. From the **Main Menu**, select **INPUT** to display the **Input Menu**.

  b. Scroll to the **Timing Adjust** line and press **SEL** to display the **Timing Adjust Menu**.

  c. Scroll to the **H Position** line and press **SEL** to adjust the image's horizontal position.

About the ACS-2048

The following topics are discussed in this section:

- **Overview**
- **Features**
- **A Word About HDCP**

Overview

As the ideal peripheral for all Barco digital cinema installations, ACS-2048 is an 8 x 1 video switcher that accepts "universal" input formats, and outputs up to 12-bit DVI at 2048 x 1080. With a high-quality scaler at its core, upconverting any input format is as simple as "auto-acquiring" and selecting the desired input. However, disguised as a switcher, ACS-2048 is a pathway to new revenue streams for your facility. By enabling "alternate" content to be displayed in the digital cinema resolution, your theatre's role as a presentation facility for events, businesses, conventions and so much more — becomes a reality.

Please note:

- To ensure trouble-free installation and operation of your ACS-2048, please follow all procedures in the following two sections:
  - ~ Chapter 3, "**Installation**" on page 25.
  - ~ Chapter 4, "**Operation**" on page 31.
- Should you have any questions regarding the installation or operation of the ACS-2048 system, please consult with the factory. Refer to Appendix C, "**Contact Information**" on page 107 for contact details.

Features

Major features of the ACS-2048 system are listed below:

- Supports "universal" inputs: HD-SDI, SD-SDI, DVI, Analog, Composite, and S-Video. All inputs support standard interlaced sources, and all input connectors are located on the front panel for user convenience.
- Provides motion adaptive de-interlacing and advanced noise reduction circuits.
- Provides an HDCP "decrypted input" and "encrypted output" path. This feature enables copy-protected content to be displayed at digital cinema resolutions, while maintaining copyright security. Refer to the "**A Word About HDCP**" section on page 14 for additional information.
- Provides twin-link 12-bit DVI outputs for upconverting all inputs to 2048 x 1080.
- Includes a user-friendly front panel and an intuitive menu display.
- Provides integration with the "Communicator" touch screen on Barco digital cinema projectors, enabling seamless remote control.
- Includes input file management plus a standard "Auto Acquire" mode.
- The output adjustment feature enables the entire output to be scaled to fit the actual theatre's physical setup (e.g., curtains, drapes, and off-axis projection).

- Provides low video delay:
  - ~ For interlaced sources, maximum video delay is 5 fields total from input to screen (3 in ACS-2048 + 2 in Projector).
  - ~ For progressive sources, maximum video delay is 4 fields total from input to screen (2 in ACS-2048 + 2 in Projector).

A Word About HDCP

HDCP stands for **High-Bandwidth Digital Content Protection**, an industry-wide copy protection scheme that is used to prevent the potential interception of digital data between the source (e.g., a Blu-Ray player) and the target display (e.g., a digital cinema projector). The HDCP format was designed by Intel, and it uses an “authentication and key exchange” procedure to accomplish the required protection. For proper implementation, products that are compatible with the HDCP format require a secure connection to a compliant display, such as a digital cinema projector.

In digital cinema applications in which an ACS-2048 is used, when an HDCP compliant device is connected to the ACS-2048, an HCDP “session” is created. In this session (which is transparent to the user), “keys” are exchanged between the source device (e.g., a Blu-Ray player) and the digital cinema projector. The source device queries the display to ensure that the equipment is HDCP compliant before video is shown. Note that non-HDCP equipment such as PCs will work with any DVI compliant display, but HDCP compliant equipment only shows content on HDCP compliant displays.

Please note the following important points:

- When an HDCP compliant device is connected to the ACS-2048 and that specific input is selected, the **Status Menu** indicates if HDCP is enabled.
- If the “session” determines that the target display device is non-HDCP compliant (e.g., if the user is attempting to make an illegal copy on an external recorder), an error message appears on the ACS-2048’s **Status Menu**, indicating that video cannot be shown.
- HDCP compliant repeaters cannot be connected to the output of the ACS-2048, as the ACS-2048 *must* be the last device in the HDCP "chain" — prior to the HDCP compliant display device (projector). If an HCDP repeater is connected, the message “**HDCP Violation**” appears on the **Status Menu**. Refer to the “**Status Menu**” section on page 66 for additional details.

Connectivity Diagram

The figure below illustrates a basic ACS-2048 system.

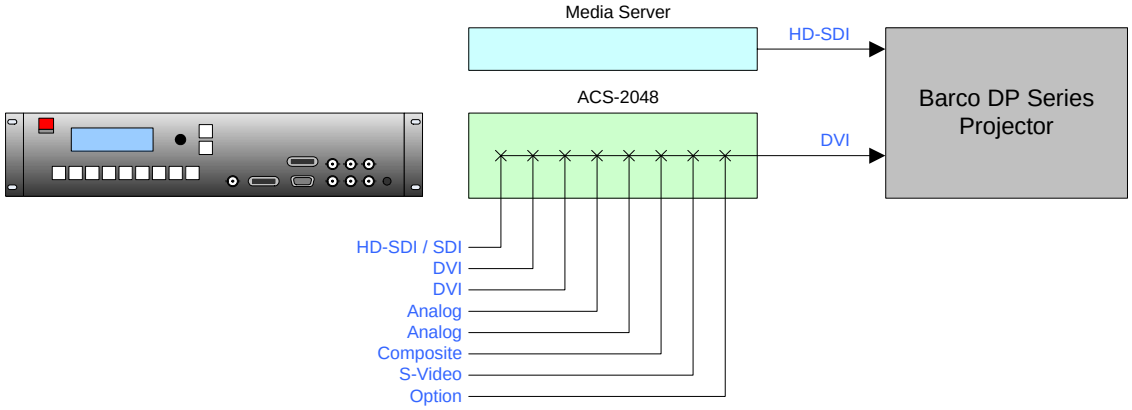


Figure 1-1. Block diagram, ACS-2048 system

In the diagram:

- Your selected media server connects to the Barco projector via dual-link HD-SDI.
- The ACS-2048 connects to the Barco projector via single link 8-bit DVI or twin-link 10/12-bit DVI.
- Eight dedicated inputs are available:
  - 1 x SDI or HD-SDI, for serial digital or HD sources
  - 2 x DVI, for computer sources. Note that these DVI connectors also support analog RGB inputs.
  - 2 x Analog, for a variety of YUV and RGBHV sources
  - 1 x composite, for composite NTSC or PAL video sources (e.g., DVD)
  - 1 x S-Video, for encoded NTSC or PAL Y/C or S-Video sources
  - 1 x Aux (not currently implemented)

In Chapter 2, refer to the "**Inputs Section**" heading on page 21 for details on all inputs.

Application Questions

At Barco, we take pride in offering unique solutions to demanding technical problems. If you have application questions, require further information or would like to discuss your application requirements in more detail, please call (866) 469-8036. Our Customer Support Engineers will be happy to supply you with the support you need. Refer to Appendix C, "**Contact Information**" on page 107 for details.

2. Hardware Orientation

In This Chapter

This chapter provides detailed diagrams of the ACS-2048's front and rear panels, along with comprehensive explanations of each.

The following topics are discussed:

- **ACS-2048 Front Panel**
- **ACS-2048 Rear Panel**

ACS-2048 Front Panel

The figure below illustrates the ACS-2048 front panel:

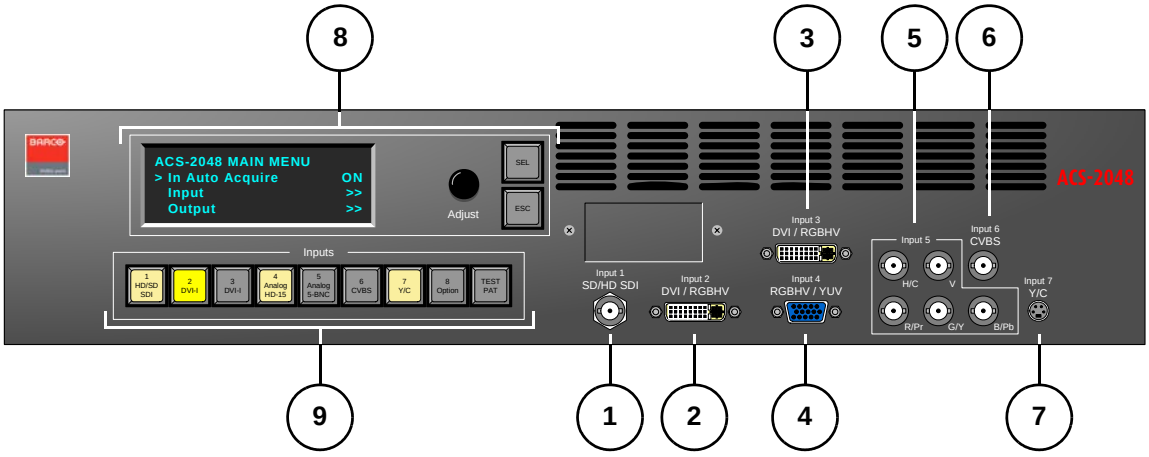


Figure 2-1. ACS-2048 Front Panel

1)	**Input 1 Connector**	4)	**Input 4 Connector**	7)	**Input 7 Connector**
2)	**Input 2 Connector**	5)	**Input 5 Connector**	8)	**Display Section**
3)	**Input 3 Connector**	6)	**Input 6 Connector**	9)	**Inputs Section**

Following are descriptions of each front panel section:

1) Input 1 Connector

One BNC connector is provided for **Input 1**, which corresponds to the first button in the **Inputs Section**. The input is dedicated to HD-SDI or SD-SDI. In Appendix A, refer to the "**Input Specifications**" section on page 82 for details.

2) Input 2 Connector

One DVI-I connector is provided for **Input 2**, which corresponds to the second button in the **Inputs Section**. The input is dedicated to an 8-bit digital input, or RGBHV data using the DVI connector's analog pins.

Note

This input does not support analog composite, S-Video, or YUV formats.

In Appendix A, refer to the "**Input Specifications**" section on page 82 for specifications, and the "**DVI-I Connector Pinouts**" section on page 87 for pinouts.

3) Input 3 Connector

One DVI-I connector is provided for **Input 3**, which corresponds to the third button in the **Inputs Section**. This input is identical to **Input 2**.

4) Input 4 Connector

One HD-15 connector is provided for **Input 4**, which corresponds to the fourth button in the **Inputs Section**. The input is dedicated to YUV or RGBHV formats. Please note:

- ~ This input provides 10-bits/color sampling at a maximum 170 MHz.
- ~ This input supports 1:1 sampling up to 1600x1200@60 Hz. Sources with native pixel rates greater than 170 MHz will be filtered and undersampled at 170 Mhz. These include:
  - 1920x1080p@60 (173.0 MHz)
  - 1920x1200@60 (193.25 MHz)
  - 2048x1080p@60 (183.75 MHz)

Note This input does not support Composite or S-Video formats.

In Chapter 3, refer to the "**Format Connection Table**" section on page 30 for a table of analog input combinations using a breakout cable. In Appendix A, refer to the "**Input Specifications**" section on page 82 for specifications, and the "**Analog 15-pin D Connector**" section on page 86 for pinouts.

5) Input 5 Connector

Five BNC connectors are provided for **Input 5**, which corresponds to the fifth button in the **Inputs Section**. This input is *almost* identical to **Input 4**, except that BNC connectors are used in place of the HD-15 connector.

6) Input 6 Connector

One BNC connector is provided for **Input 6**, which corresponds to the sixth button in the **Inputs Section**. The input is dedicated to Composite NTSC or PAL video. In Appendix A, refer to the "**Input Specifications**" section on page 82 for details.

7) Input 7 Connector

One 4-pin mini-DIN connector is provided for **Input 7**, which corresponds to the seventh button in the **Inputs Section**. The input is dedicated to encoded NTSC or PAL Y/C video. In Appendix A, refer to the "**Input Specifications**" section on page 82 for details, and the "**Mini-DIN Connector**" section on page 88 for pinouts.

8) Display Section

The **Display Section** includes the four-line display, the **ADJUST** knob and two "menu navigation" buttons: **SEL** and **ESC**. Refer to the "**Display Section**" heading on page 20 for complete details.

9) Inputs Section

The **Inputs Section** includes eight buttons that enable you to select inputs, plus a **TEST PAT** button that enables you to output a selected test pattern. Refer to the "**Inputs Section**" heading on page 21 for complete details.

Display Section

The figure below illustrates the **Display Section**:

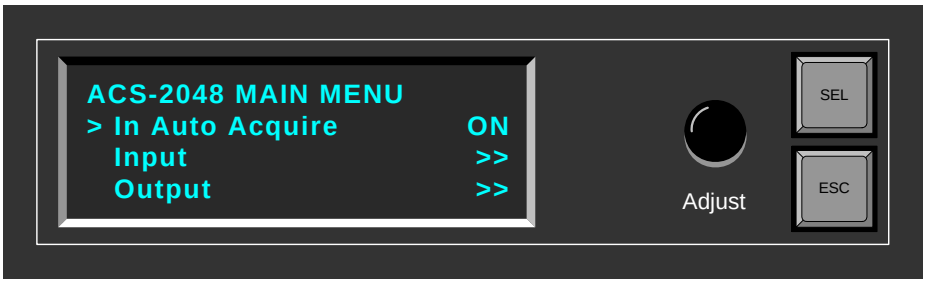


Figure 2-2. Display Section with Main Menu

Descriptions of each button and control are provided below:

- The **Menu Display** is a 4 line x 20 character Vacuum Fluorescent Display (VFD) that shows all ACS-2048 menus and sub-menus. Brightness is adjustable.

Figure 2-3. Sample Menu Display (Main Menu)

Please note:

~ The top line names the current menu, in all capital letters.

~ The navigation cursor (**>**) in the left-hand column indicates the current line on which action can be taken.

~ The double arrow (**>>**) indicates that a sub-menu is available.

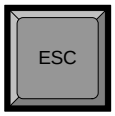
In Chapter 4, refer to the "**Menu Tree**" section on page 35 for menu details.

- **ADJUST** — use the **Adjust Knob** to scroll through all system menus.

~ Turn the knob counter-clockwise (**CCW**) to scroll down.

~ Turn the knob clockwise (**CW**) to scroll up.

- **SEL** — press to enter a sub-menu, change a parameter, accept a parameter, or to answer "**Yes**" to certain menu queries.



- **ESC** — press to exit a menu without making changes, cancel an operation, or to answer "**No**" to certain menu queries. Each press takes you back up the menu tree by one level.

Inputs Section

The figure below illustrates the **Inputs Section**:

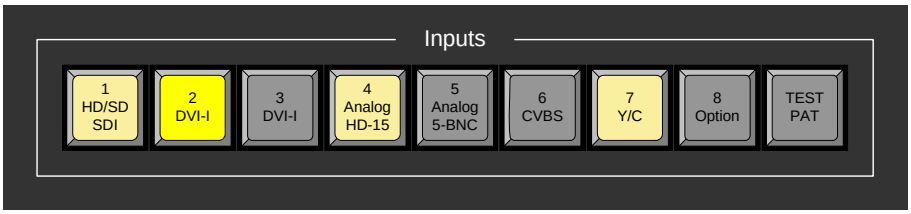
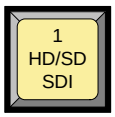


Figure 2-4. Inputs Section

The buttons in the **Inputs Section** enable you to select system inputs, or the built-in test pattern. There are four button states:

- **Off** — indicates that sync has not been detected on the input connector, and the input cannot be used on air.



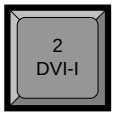
- **Dim Yellow** — (or backlight on) indicates that sync has been detected, and the source is valid, and available for use on air.

- **Bright Yellow** — indicates the currently selected “on air” source.

- **Blinking** — indicates that sync has been lost from the current “on air” source. In this situation, internal black automatically replaces the previous on air source, and the source cannot be used on air until sync is restored.

Descriptions of each input button are provided below. When any valid input is selected, the button lights, and the input is routed to the output using a transition through black. The transition rate is adjustable in the **System Menu**.

- **1** — selects an HD-SDI or SD-SDI input (the front panel **Input 1** connector) as the ACS-2048’s source.



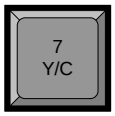
- **2** — selects a digital DVI or analog RGBHV input (the front panel **Input 2** connector) as the source.

- **3** — selects a digital DVI or analog RGBHV input (the front panel **Input 3** connector) as the source.

- **4** — selects a YUV or RGBHV input (the front panel **Input 4** connector) as the source.

- **5** — selects a YUV or RGBHV input (the front panel **Input 5** connector) as the source.

- **6** — selects a Composite NTSC or PAL input (the front panel **Input 6** connector) as the source.



- **7** — selects an encoded NTSC or PAL Y/C input (the front panel **Input 7** connector) as the source.

- **8** — this input is currently not implemented.

- **TEST PAT** — selects the internal test pattern as the source.
  - There are two ways to use the **TEST PAT** button:
    - ~ When **TEST PAT** is pressed, the button lights, and the internal test pattern is routed to the output using a CUT transition. When another input is selected, the system transitions to the new input.
    - ~ When the **TEST PAT** button is already lit, press the **TEST PAT** button again to toggle back to the last selected input.

Note

If the **Menu Context** mode is **ON** in the **User Preference Menu**, the **Test Patterns Menu** appears whenever the **TEST PAT** button is pressed, allowing you to select an internal test pattern and adjust additional test pattern parameters.

In Chapter 4, refer to the "**Using Test Patterns**" section on page 70 for details.

ACS-2048 Rear Panel

The figure below illustrates the ACS-2048 rear panel:

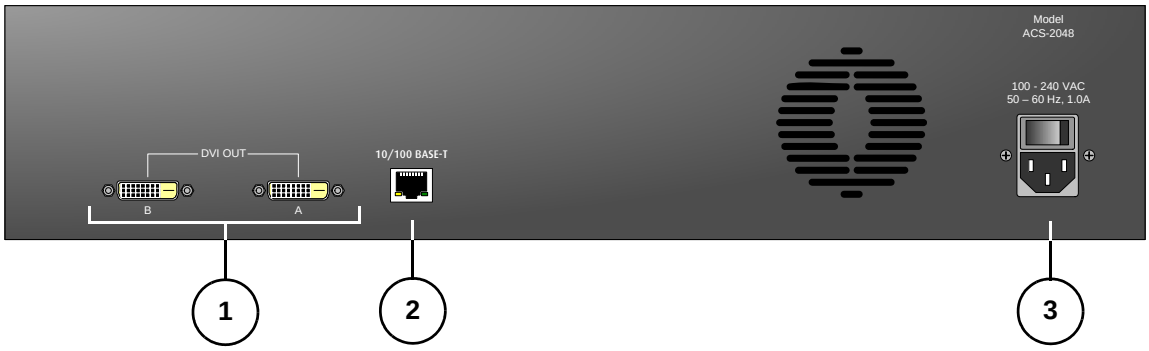


Figure 2-1. ACS-2048 Rear Panel

1)	**DVI Outputs**	3)	**AC Power**
2)	**Ethernet**		

Following are descriptions of each rear panel connector:

1) DVI Outputs

Two DVI-D connectors (**A** and **B**) are provided for the system's dual-channel (Twin-Link) DVI output. These outputs provides a 10-bit or 12-bit (4:4:4 RGB) signal as follows:

- **Connector A**: 8 msb (most significant bit). Only 8-bit output mode can be selected on this connector, providing standard 8-bit DVI output.
- **Connector B**: 2 or 4 lsb (least significant bit), depending on the output selection. To increase color depth, 10-bit or 12-bit output mode can be selected on this connector. Use the **Output Menu** to change the output mode and bit-width. In Chapter 4, refer to the "**Output Menu**" section on page 53 for details.

Please note:

- In 10-bit or 12-bit mode, both outputs (A and B) must be connected to the projector. In 8-bit mode, a connection is required from Connector A only.
- HDCP encryption is provided on both connectors A and B.
- Frame rates of 50Hz and 59.94Hz are supported.

In Appendix A, refer to the "**Output Specifications**" section on page 83 for details, and the "**DVI-I Connector Pinouts**" section on page 87 for pinouts.

2) Ethernet

One RJ-45 connector is provided for 10/100BaseT **Ethernet** communications with the ACS-2048 system. The port is typically used for diagnostics or command-line operations via Telnet (using port 23).

- telnet 192.168.1.100 23

In Appendix A, refer to the "**Ethernet Connector**" section on page 88 for pinouts.

3) AC Power

One **AC Connector** is provided for connecting ACS-2048 to AC. The integral switch turns the chassis on and off. In Appendix A, refer to the "**Physical and Electrical Specifications**" section on page 84 for power details.

3. Installation

In This Chapter

This chapter provides detailed instructions for installing the ACS-2048 hardware. The following topics are discussed:

- **Safety Precautions**
- **Unpacking and Inspection**
- **Site Preparation**
- **Cable and Adapter Information**
- **Rack-Mount Installation**
- **Power Installation**
- **Signal Installation**
- **Format Connection Table**

Safety Precautions

For all ACS-2048 installation procedures, observe the following important safety and handling rules to avoid damage to yourself and the equipment:

- To protect users from electric shock, ensure that the power supplies for each unit connect to earth via the ground wire provided in the AC power cord.
- The AC Socket-outlet should be installed near the equipment and be easily accessible.

Unpacking and Inspection

Inspect the shipping box for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your Barco sales representative.

Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect each unit to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

Site Preparation

The environment in which you install your ACS-2048 should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

Cable and Adapter Information

The table below provides information regarding supplied cables and adapters:

Table 3-1.

Cable / Adapter	Description	Quantity
AC Power Cord	7 foot, 10A	1
DVD-D Cable	5 meters. Connects ACS-2048 outputs to projector	2

Rack-Mount Installation

ACS-2048 units are designed to be rack mounted and are supplied with front rack-mount hardware. Please note the following important points:

- When rack mounting the unit, remember that the maximum ambient operating temperature for the unit is 40 degrees C.
- Leave sufficient front and rear space to ensure that the airflow through the fan and vent holes is not restricted.
- When installing equipment into a rack, distribute the units evenly to prevent hazardous conditions that may be created by uneven weight distribution.
- Connect the unit only to a properly rated supply circuit.
- Reliable grounding (earthing) of rack-mounted equipment should be maintained.
- Rack mount the unit from the front rack ears using four rack screws (not supplied). Rack threads may be metric or otherwise — depending upon the rack type.
- Install the *lower* of the two mounting holes first.

Power Installation

- Use the following steps to install power to the ACS-2048:

  1. Connect an AC power cord to the AC Power Connector on the rear of the ACS-2048, and then to an AC outlet.

  2. Connect AC Power cords (or AC adapters) to all peripheral equipment, such as video sources and PCs. Please note:

  ~ Connect each unit only to a properly rated supply circuit.

  ~ Reliable grounding of rack-mounted equipment should be maintained.

Power Cord/Line Voltage Selection

ACS-2048 is rated to operate with the following specifications:

- **Input Power**: 100-240 VAC, 50-60 Hz
- **Power Consumption**: 240 watts maximum

ACS-2048 performs line voltage selection automatically, and no user controls are required. The AC power cords must be accessible so that they can be removed during field servicing.

Warning

When the ACS-2048 is used in the 230-volt mode, a UL listed line cord rated for 250 volts at 15 amps must be used and must conform to IEC-227 and IEC-245 standards. This cord will be fitted with a tandem prong-type plug.

The rear panel ON/OFF switch does not disconnect the unit from input AC power. To facilitate disconnection of AC power, the power cord must be connected to an accessible outlet near the unit.

Building Branch Circuit Protection: For 115 V use 20 A, for 230 V use 8 A.

Figure 3-1. Tandem Prong-type Plug

Avertissement

La choix de la ligne de voltage se réalise automatiquement par le ACS-2048 Transformateur Graphique. On n'a pas besoin du controller usager pour la choix de la ligne de voltage.

Warnung

Das ACS-2048 gerät mu beim Anschlu an 240V ~ mit einer vom VDE auf 250V/10A geprüften Netzleitung mit einem Schukostecker ausgestattet sein.

Signal Installation

The figure below illustrates a sample ACS-2048 system diagram. Use this figure for reference during the signal installation process.

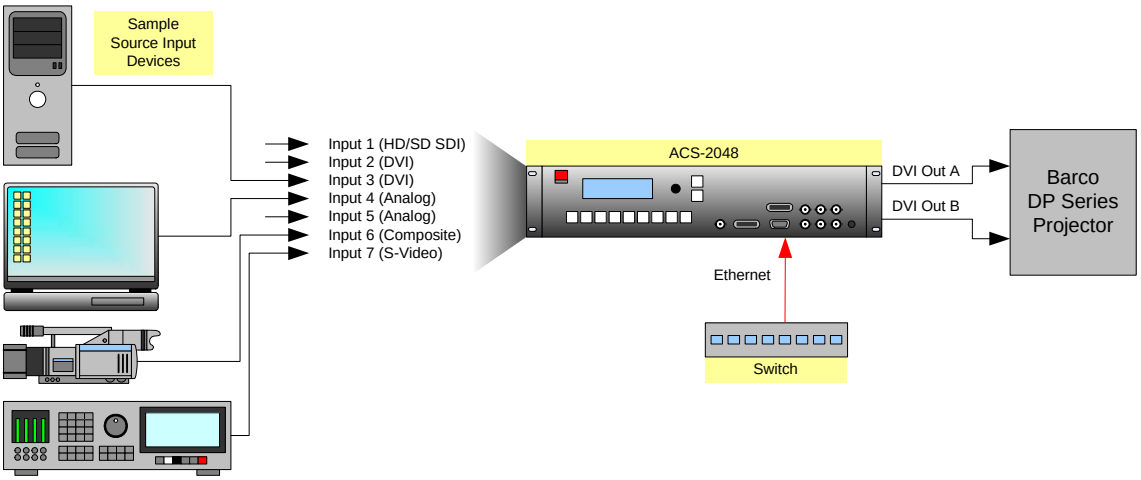


Figure 3-2. ACS-2048 System Diagram (sample)

- Use the following steps to install signals to/from the ACS-2048:

1. **Input connections** — any combination of inputs can be connected. If the system detects valid sync on the input signal, the associated front panel input button will light dim (backlight enabled). If sync is not detected, the button will not light.

   a. Connect an HD-SDI or SD-SDI source to the **Input 1** connector (e.g., from an SDI camera or SDI server).

   b. Connect a digital DVI or analog RGBHV source to the **Input 2** connector (e.g., from a laptop or PC). This input does not support Composite, S-Video, or YUV formats.

   c. Connect a digital DVI or analog RGBHV source to the **Input 3** connector. Inputs 2 and 3 are identical. This input does not support Composite, S-Video, or YUV formats.

   d. Connect a YUV or RGBHV source to the **Input 4** connector (e.g., from a YUV or RGB source, or a laptop). This input does not support Composite or S-Video formats. Refer to the "**Format Connection Table**" section on page 30 for a table of analog input combinations.

   e. Connect a YUV or RGBHV source to the **Input 5** connector. Inputs 4 and 5 are identical. This input does not support Composite or S-Video formats. Refer to the "**Format Connection Table**" section on page 30 for a table of analog input combinations.

   f. Connect a Composite NTSC or PAL source to the **Input 6** connector (e.g., from an analog camera).

   g. Connect an encoded NTSC or PAL Y/C source to the **Input 7** connector (e.g., from an S-Video source, such as a DVD player).

Note — **Input 8** is currently not implemented.

2. **Output connections**:
   a. If you are operating the ACS-2048 in 10-bit or 12-bit mode, connect both DVI outputs (A and B) to the projector's DVI inputs A and B.
   b. If you are operating the ACS-2048 in 8-bit mode, connect DVI output A to the projector's DVI input A.
3. **Communications connection**:
   a. Connect the ACS-2048's Ethernet port to an Ethernet switch, and connect the switch to the other Ethernet devices in your local system (e.g., laptop, projector, etc.). This connection enables you to communicate with the ACS-2048 via Telnet. In Appendix B, refer to the "**Communicating with ACS-2048**" section on page 93 for details.

This completes system signal installation. Please continue with system setup, menu orientation and operations, as outlined in Chapter 4, "**Operation**" on page 31.

Format Connection Table

Use the following table to connect various source formats to the ACS-2048, using the universal input connectors (on **Input 4** and **Input 5**) in conjunction with a customer supplied VGA to 5 x BNC breakout cable. Please note:

- **RGB format** — typical devices: Computers
- **YUV or YP_bP_r (Betacam) format** — typical devices: DVD player, Betacam deck

Important Inputs **4** and **5** do not support Composite or S-Video formats.

Using a customer supplied VGA to 5 x BNC breakout cable, multiple input combinations are possible. Cells with checks denote the connections required for the indicated format.

Note For RGB with H and V sync, use the VGA connector directly (**Input 4**), or all five BNCs (**Input 5**).

Table 3-2. Analog Input Combinations using Breakout Cable

Breakout Cable Wire Color		YUV (YP_bP_r)	RGB Sync on Green	RGB Comp Sync	RGB Separate H V
R		✓ (P_r)	✓	✓	✓
G		✓ (Lum)	✓	✓	✓
B		✓ (P_b)	✓	✓	✓
H Sync				✓	✓
V Sync					✓

Please contact **Barco Technical Support** for information on obtaining breakout cables. In Appendix C, refer to the "**Contact Information**" section on page 108 for details.

4. Operation

In This Chapter

This chapter provides comprehensive menu descriptions and detailed operating instructions for the ACS-2048. The following topics are discussed:

- **Control Overview**
- **Power-Up Initialization**
- **Quick Setup and Operations**
- **Menu Tree**
- **Quick Function Reference**
- **Using the Main Menu**
- **Using Inputs**
- **Using Test Patterns**
- **Front Panel Lockout**

Control Overview

There are several ways to control the ACS-2048:

- The front panel is ideal for all basic system configurations. Available controls include the **Display Section** and the buttons in the **Inputs Section**.
- The ACS-2048 can also be controlled remotely via Ethernet. All system commands are available. Typically, remote commands are used to switch inputs from the Barco projector's "Communicator" touch screen, but more advanced interfaces can be configured using the protocol. Refer to **Appendix B** on page 93 for additional details.

Power-Up Initialization

After connecting power to the ACS-2048, locate the power switch on the back of the chassis, and turn the power **ON**. While the system is initializing, the following messages are displayed:

Figure 4-1. System initialization message 1

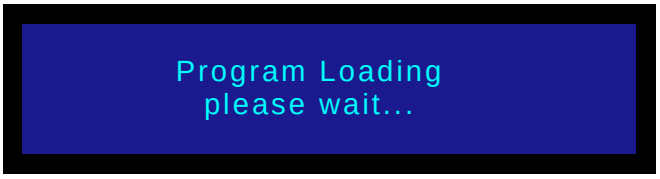


Figure 4-2. System initialization message 2

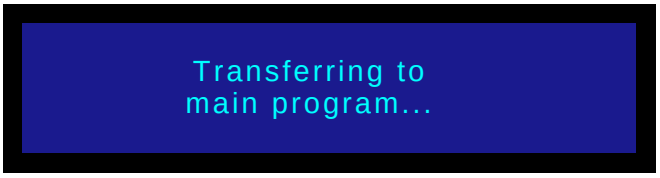


Figure 4-3. System initialization message 3

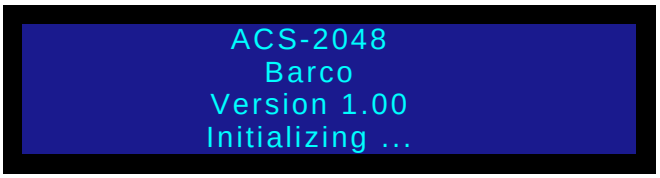


Figure 4-4. System initialization message 4

The “version” line in the above menu shows the software version that is currently being executed. This version number will change as software upgrades are released.

Quick Setup and Operations

For the optimum speed in system setup and operations, use the following steps. For reference, links are provided to pertinent sections in this guide.

1. **Determine output mode** — Determine the output operating mode of the ACS-2048, and connect output cables accordingly:
   - ~ If you elect to operate in 8-bit mode, ensure that Output Connector A is connected to the projector’s DVI input A.
   - ~ If you elect to operate in 10-bit or 12-bit mode, ensure that output Connectors A and B are connected to the projector’s DVI inputs A and B.

   In Chapter 2, refer to the “**ACS-2048 Rear Panel**” section on page 23.
2. **Connect power** — Ensure that power is properly connected to the ACS-2048. In (Chapter 3, “**Power Installation**” on page 27.)
3. **Connect Ethernet** — Ensure that Ethernet is properly connected to the ACS-2048. (Chapter 3, “**Signal Installation**” on page 29.)
4. **Turn on power** — Turn on power to the ACS-2048, your projector, and to all peripheral devices as required. (This chapter, “**Power-Up Initialization**” on page 32.)
5. **Set output format** — Set the desired output format. There are two choices:
   - ~ 2048x1080p @ 59.94Hz
   - ~ 2048x1080p @ 50Hz

   (This chapter, “**Output Format**” on page 53.)
6. **Set output mode** — Set the desired output mode to 8-bit, 10-bit or 12-bit. (This chapter, “**Output Mode**” on page 53.)
7. **Adjust output** — As required, scale the output to fit the actual projected image. (This chapter, “**Output Adjust**” on page 55.)
8. **Save output configuration** — After completing all output adjustments, save the output configuration. (This chapter, “**Save Output Config**” on page 56.)
9. **Enable test pattern** — Turn on the desired test pattern, and verify that you have an image on your projector. When complete, turn off the test pattern. (This chapter, “**Test Pattern**” on page 54.)

10. **Connect inputs** — Connect all inputs to the ACS-2048, and check for the proper backlight, which indicates that sync is detected. (Chapter 3, "**Signal Installation**" on page 29. This chapter, "**Understanding Backlighting**" on page 68.)
11. **Select and adjust inputs** — As required, select an input, and perform the necessary adjustments, such as crop, brightness, contrast, color balance, and timing. (This chapter, "**Input Menu**" on page 43.)
12. **Save input configuration** — After completing all adjustments for an input, save the input configuration. (This chapter, "**Save Input Config**" on page 51.)
13. **Repeat for each input** — repeat steps 10 and 11 for each input that you have connected to the ACS-2048.
14. **Adjust system parameters** — As required, adjust all desired system parameters such as transition time, display brightness, and your user preferences. (This chapter, "**System Menu**" on page 57.)
15. **Save system configuration** — After completing all system adjustments, save the system configuration. (This chapter, "**Save System Config**" on page 64.)
16. **Ready to roll** — With all output, input and system configurations saved, press the desired input button, and begin your presentation. Ensure that the button is lit, indicating that the signal is valid.

Note

For advanced system operations, specific system "tweaks" and operating descriptions on every feature, please start with the "**Quick Function Reference**" section on page 38, and select the function that you wish to perform.

Menu Tree

The figure below illustrates the entire ACS-2048 menu tree. Please use this diagram for reference as you learn how to operate the system.

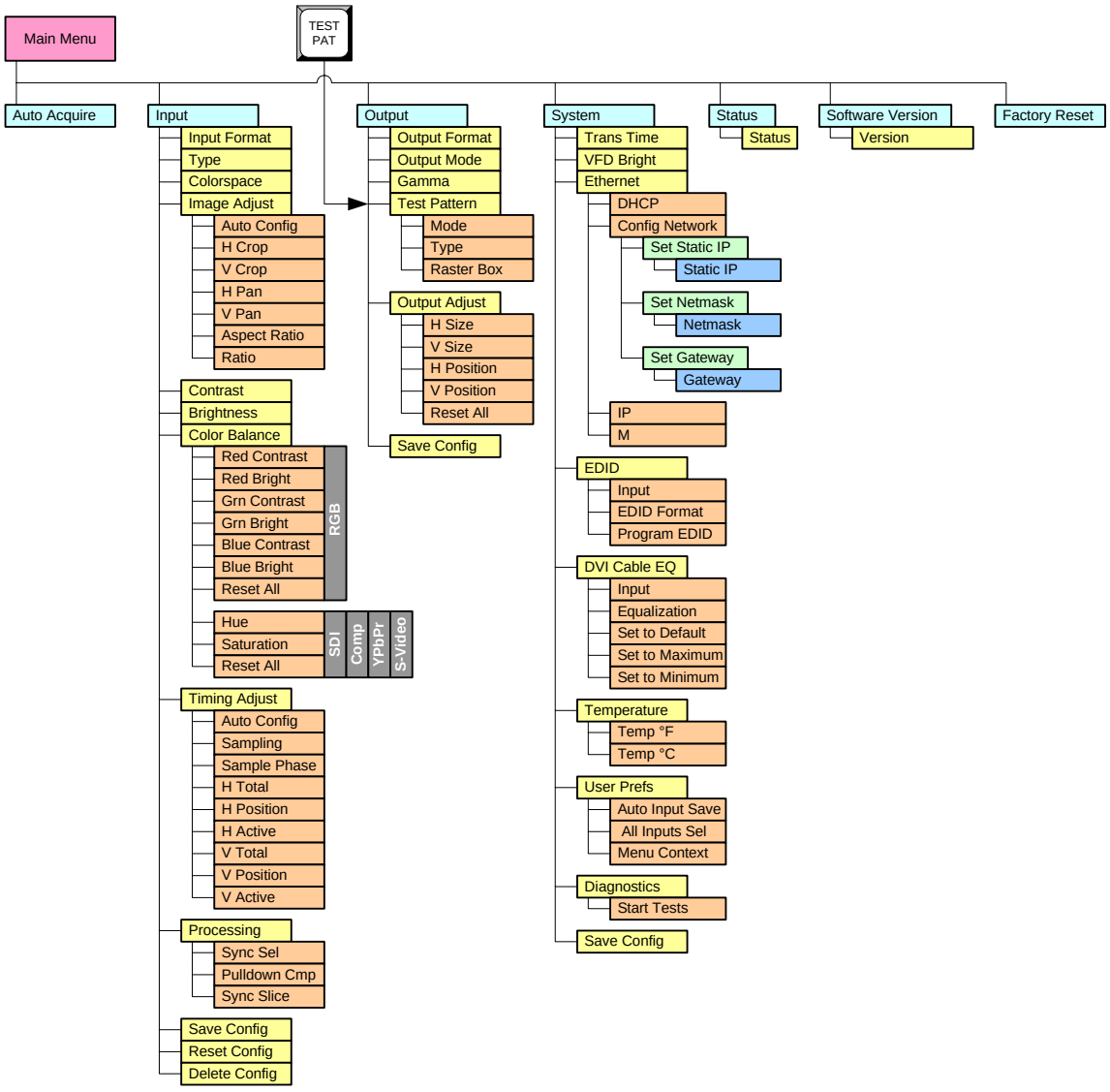


Figure 4-5. ACS-2048 Menu Tree

Using the Menu System

This section lists the rules and conventions for using ACS-2048's menu system. For reference, the figure below illustrates the **Main Menu**:

Figure 4-6. Main Menu Display

Please note the following important menu rules and conventions:

- The top line names the current menu, in all capital letters.
- Subsequent lines typically display two fields:
  - ~ For a listed **function**, the left-hand field names the function, and the right-hand field is the function's current parameter (or value).
  - ~ For a listed **sub-menu**, the left-hand field names the sub-menu that you can access, and the right-hand field displays the double arrow (**>>**), indicating that a sub-menu is available.
- The "navigation" **cursor** (**>**) in the left-hand column indicates the current line on which action can be taken. This arrow "scrolls" as you rotate the knob.
- Scrolling:
  - ~ Turn the **ADJUST** knob counter-clockwise (**CCW**) to scroll down.
  - ~ Turn the **ADJUST** knob clockwise (**CW**) to scroll up.
- To enter a sub-menu, scroll to the desired line and press **SEL**.

Note

Throughout this chapter, the term "**select**" is used as an abbreviation for "scroll to a selected menu line and press the **SEL** button."

▲ Select the **Input** field to ...

- To change a parameter, scroll to the desired line and press **SEL**. The cursor changes to the "edit" cursor (**#**). Use the **ADJUST** knob to modify the value:
  - ~ Turn the **ADJUST** knob **CW** to increase a value.
  - ~ Turn the **ADJUST** knob **CCW** to decrease a value.
- To accept a parameter or value, press **SEL**. The edit cursor changes back to the navigation cursor.

Note

You must press **SEL** to activate an ACS-2048 function.

- In the "edit" mode, to exit (or cancel) without changing the original parameter, press **ESC**.

- To navigate back up the menu structure, press **ESC**. Each press takes you back up the menu tree by one level.
- The **SEL** button is also used to answer "**Yes**" to certain menu queries. The **ESC** button is also used to answer "**No**" to certain menu queries.

Note

The display itself is four lines high, and the **ADJUST** knob is used to scroll through the various lines. Throughout this chapter, *entire* menus will be shown for clarity — rather than a series of four-line sections.

- If a value is displayed between brackets, (e.g., **[SMPTE]**) this indicates that the value can not be changed.

Quick Function Reference

Use the following table to quickly access the proper menu for a specific function. Both hyperlinks and page numbers are provided.

Table 4-1. ACS-2048 Quick Function Reference Table

How to:	Use the Following Section:	Page
Adjust color balance	Color Balance	47
Adjust display brightness	VFD Brightness	58
Adjust H Total, Position, Active	Timing Adjust	48
Adjust image aspect ratio	Image Adjust	46
Adjust image brightness	Brightness	47
Adjust image contrast	Contrast	47
Adjust image processing	Processing	50
Adjust image timing	Timing Adjust	48
Adjust input colorspace	Colorspace	45
Adjust input format	Input Format	44
Adjust output format	Output Format	53
Adjust output gamma	Gamma	54
Adjust output size / position	Output Adjust	55
Adjust pulldown comp	Processing	50
Adjust sample phase	Timing Adjust	48
Adjust sync selection	Processing	50
Adjust sync slice	Processing	50
Adjust the image	Image Adjust	46
Adjust transition time	Trans Time	57
Adjust V Total, Position, Active	Timing Adjust	48
Auto acquire inputs	In Auto Acquire	42
Change color balance	Color Balance	47
Change display brightness	VFD Brightness	58
Change DVI cable equalization	DVI Cable Equalization	62
Change EDID DVI format	EDID DVI Input Format	60
Change Ethernet parameters	Ethernet	58
Change image aspect ratio	Image Adjust	46
Change image brightness	Brightness	47

Table 4-1. ACS-2048 Quick Function Reference Table (Continued)

How to:	Use the Following Section:	Page
Change image contrast	Contrast	47
Change image processing	Processing	50
Change image timing	Timing Adjust	48
Change input colorspace	Colorspace	45
Change input format	Input Format	44
Change input type	Type	44
Change output format	Output Format	53
Change output gamma	Gamma	54
Change output mode (8-bit, 10-bit, 12-bit)	Output Mode	53
Change sampling (1:1, Oversample)	Timing Adjust	48
Change test pattern type	Test Pattern	54
Change transition time	Trans Time	57
Change user preferences	User Preference	63
Check system temperature	Temperature	62
Configure Ethernet network	Ethernet	58
Crop the image	Image Adjust	46
Delete input configuration	Delete Config	52
Display software version	Software Version	67
Display system status	Status Menu	66
Enable or disable all input select	User Preference	63
Enable or disable auto input save	User Preference	63
Enable or disable DHCP	Ethernet	58
Enable or disable menu context mode	User Preference	63
Enable or disable raster box	Test Pattern	54
Enable or disable test patterns	Test Pattern	54
Enable or disable Auto Acquire mode	In Auto Acquire	42
Equalize DVI cables	DVI Cable Equalization	62
Lock out front panel	Front Panel Lockout	71
Navigate the Menu Tree	Menu Tree	35
Pan the image	Image Adjust	46
Perform factory reset	Factory Reset	67
Perform quick setup and operations	Quick Setup and Operations	33
Program EDID	EDID DVI Input Format	60

Table 4-1. ACS-2048 Quick Function Reference Table (Continued)

How to:	Use the Following Section:	Page
Reset input configuration	Reset Config	51
Reset to factory default	Factory Reset	67
Run system diagnostics	Diagnostics	64
Save input configuration	Save Input Config	51
Save output configuration	Save Output Config	56
Save system configuration	Save System Config	64
Select inputs	Input Selection Rules	68
Set Ethernet gateway	Ethernet	58
Set Ethernet netmask	Ethernet	58
Set Ethernet static IP address	Ethernet	58
Set user preferences	User Preference	63
Turn on system power	Power-Up Initialization	32
Understand auto acquire	Understanding Auto Acquire	69
Understand button backlighting	Understanding Backlighting	68
Understand input selection rules	Input Selection Rules	68
Use front panel lockout mode	Front Panel Lockout	71
Use inputs	Using Inputs	68
Use test patterns	Using Test Patterns	70
Use the Input Menu	Input Menu	43
Use the Main Menu	Using the Main Menu	41
Use the menu system	Using the Menu System	36
Use the SEL and ESC knobs	Using the Menu System	36
View software version	Software Version	67
View system status	Status Menu	66

Using the Main Menu

After ACS-2048 initialization is complete, the **Main Menu** appears. This is the system's top-level menu.

Note

When you make changes to input, output and system parameters, this "configuration" information can be stored in non-volatile memory — provided that the user performs a "**Save Config**" operation. These settings will be automatically recalled each time the unit is turned on. Note that if the "**Auto Input Save**" function is enabled in the **User Preferences Menu**, the system automatically saves inputs.

Figure 4-7. Main Menu

Following are descriptions of each **Main Menu** function:

- **In Auto Acquire**
- **Input Menu**
- **Output Menu**
- **System Menu**
- **Status Menu**
- **Software Version**
- **Factory Reset**

In Auto Acquire

From the **Main Menu**, select **In Auto Acquire** to enable or disable the **Input Auto Acquire** mode. Values are: **OFF** and **ON** (default).

- When **Input Auto Acquire** is **ON**, the system always performs a full sync acquisition on the selected input signal under the following conditions:
  - ~ When an input channel *without* a saved configuration file is selected.
  - ~ When the input type is changed.
  - ~ When the input signal changes sync rates.
  - ~ When an input *with* a saved configuration file is selected, but the input timing is different from the saved configuration.
- When **Input Auto Acquire** is **OFF**, the system uses the last known configuration for each input channel, to the greatest extent possible. At some point, the input signal may be too far away from the saved configuration, in which case a good input lock may not be possible. In this situation, the "**Invalid Signal**" message is shown, and the video output will be black.

Please note the following important points:

- It is recommended that you leave the **In Auto Acquire** mode **ON**. In this mode, if the timing changes on any of your inputs (whether or not you have a saved configuration file), you will always get an output image. On the other hand, if the mode is **OFF** and the timing of an input changes, the output will be black.
- When the **In Auto Acquire** mode is **ON**, the ACS-2048 automatically detects and acquires the input video type and resolution (in most cases), and limits menu selections as applicable to the detected video type (e.g., color space).
- If you are an advanced user and you know the exact timing parameters for your input(s), you can turn the **In Auto Acquire** mode **OFF**, and dial in your timing parameters manually.

Tip

If you have already saved configuration files for your input sources, it is recommended that you turn the **In Auto Acquire** mode **OFF**. This mode provides the fastest transition times. When the mode is **ON**, transition times will be greater, due to the additional time required to analyze the input timing for each selected source.

Input Menu

From the **Main Menu**, select **Input** to display the **Input Menu**. The selected input button is shown on the top line.

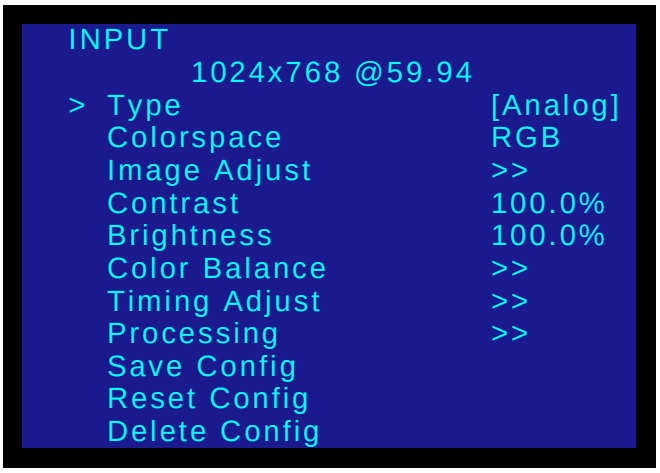


Figure 4-8. Input Menu (sample)

The **Input Menu** enables you to set configuration options for the selected input channel. The menu can be used in two ways:

- Select an input button *first*, then use the menu to set all input parameters.
- While you are already within the **Input Menu**, select a *different* input button. In this case, the menu fields update to reflect the values for the newly selected input.

Note

Changing the menu entries for one input will not affect the input configuration of the other channels.

Following are descriptions of each **Input Menu** function:

- **Input Format**
- **Type**
- **Colorspace**
- **Image Adjust**
- **Contrast**
- **Brightness**
- **Color Balance**
- **Timing Adjust**
- **Processing**
- **Save Input Config**
- **Reset Config**
- **Delete Config**

Input Format

From the **Input Menu**, select the top **Input Format** line to view the “auto-acquired” format for the selected input, or to change the format. The format is shown in the following form:

`Hact x Vact @ Vr Hz`

▲ 1024x768@59.94

Please note the following important points:

- If you select an input and it does not have a valid input signal, the "**Invalid Selection, No Sync Detected**" message is displayed.
- If an input was previously valid, and its video signal (or sync) is lost, the button blinks and the "**Invalid Signal**" message is displayed.
- When **In Auto Acquire** is **ON**, the input video format will be detected in the following search order:
  - ~ Last used configuration for the selected input channel
  - ~ Any saved input configuration
  - ~ Standard library formats
  - ~ Best guess (to the closest video format in the library).
- If the video format is a “best guess” as determined by the “auto acquire” mode, it is displayed (only in the **Status Menu**) within asterisks.

  ▲ *1024x768@60.11*
- If you select an input that has been saved (using the **Save Config** function), the video format is displayed (only in the **Status Menu**) within brackets.

  ▲ [1024x768@59.94] This example is a saved “exact match” from the format table (or library).

  ▲ [*1024x768@59.90*] This example is a saved “best guess.”
- When **In Auto Acquire** is **OFF**, the system attempts to lock to the signal using the user-selected input video format. If the currently selected format does not match the input signal for the selected channel, the output remains black, and the display indicates "**Invalid Signal**."

Type

In the **Input Menu**, the “information only” **Type** field shows the currently selected input type between brackets. The available input types that will be displayed depend on the selected input button:

- For input 1: **[SDI]**
- For inputs 2 and 3: **[DVI]** or **[Analog]**. The ACS-2048 automatically detects the type of input signal, and selects the correct type.

Note

If both analog and digital inputs are connected simultaneously (via a customer-supplied “**Y**” connector), the system defaults to DVI.

- For inputs 4 and 5: **[Analog]**
- For input 6: **[CVBS]**
- For input 7: **[Y/C]**

Please note:

- If a source type is chosen and a correct signal cannot be detected, the **Input Format** field (in the **Input Menu** and the **Status Menu**) indicates "**Invalid Signal**."
- For inputs 2 and 3, analog signals can be connected to the ACS-2048 using a customer-supplied DVI to HD-15 adaptor.

Colorspace

From the **Input Menu**, select **Colorspace** to change the color space for the selected input. Values depend on the selected input:

- For input 1: **[SMPTE]**
- For input 2: **RGB**, **SMPTE**
- For input 3: **RGB**, **SMPTE**
- For input 4: **RGB**, **SMPTE**
- For input 5: **RGB**, **SMPTE**
- For input 6: **[SMPTE]**
- For input 7: **[SMPTE]**

Please note:

- The default selection for **YP_bP_r** or **YUV** is SMPTE. In Appendix A, refer to the "**Input Format Table**" section on page 89 for information on the formats that are RGB, SMPTE or both. When both RGB and SMPTE are listed, the first item in the list is the default.
- When the input is analog (including CVBS, Y/C or DVI), you can select between **RGB** and **SMPTE**.
- When the following formats are detected as SD/SDI or HD/SDI, only **[SMPTE]** is shown, and this color space is unchangeable.

  - ~ NTSC (480i)
  - ~ PAL (576i)
  - ~ 1280x720p @50
  - ~ 1280x720p @59.94
  - ~ 1280x720p @60
  - ~ 1920x1080p @23.98
  - ~ 1920x1080p @24
  - ~ 1920x1080p @25
  - ~ 1920x1080p @29.97
  - ~ 1920x1080p @30
  - ~ 1920x1080sF@23.98
  - ~ 1920x1080sF@24
  - ~ 1920x1080i @50
  - ~ 1920x1080i @59.94
  - ~ 1920x1080i @60

Image Adjust

From the **Input Menu**, select **Image Adjust** to display the **Image Adjust Menu**. This menu enables you to adjust input parameters such as crop, pan and aspect ratio:

Figure 4-9. Image Adjust Menu (sample)

- Select **Auto Config** to perform an automatic input configuration on the selected source. In this mode, the system finds the first and last pixel on each edge, and ensures (to the best possible extent) that the entire image is visible. In addition, if the input is analog, the system automatically phases the input to determine the correct sampling phase.

The **Crop** and **Pan** functions allow you to crop off unwanted video (e.g., black edges), and then position the cropped image as desired within the selected aspect ratio.

- Select **H Crop** to crop both the left and right edges simultaneously. Values are in pixels. The output "window" is maintained in both size and aspect ratio.
- Select **V Crop** to crop both the top and bottom edges simultaneously. Values are in lines. The output "window" is maintained in both size and aspect ratio.

Note

For both **H Crop** and **V Crop**, the function always cuts *into* the visible image, and never exposes any video outside the source's active area. In addition, as you crop, the ACS-2048 always scales the input back up to fit the selected aspect ratio within the system's 2048 x 1080 output window.

- Select **H Pan** to pan a cropped image left and right — within the selected aspect ratio. Values are in pixels. Note that the value reads **[0]** if the image has not been cropped horizontally.
- Select **V Pan** to pan a cropped image up and down — within the selected aspect ratio. Values are in lines. Note that the value reads **[0]** if the image has not been cropped vertically.

The **Aspect Ratio** function allows you to set a pre-defined or custom ratio for the input.

- Select **Aspect Ratio** to adjust the image to one of the following values: **1:1**, **3:2**, **4:3**, **5:4**, **16:9**, **Custom**
- The **Ratio** line is only visible when **Custom** is selected:

~ **Adjustment range**: 0.750 to 3.000. Note that the default value depends on the last **Aspect Ratio** selected before **Custom** was chosen.

Note

The ACS-2048 selects and displays the input video aspect ratio according to the input format detected. For example:

- Computer video at 1280x1024@60Hz defaults to 5:4 aspect ratio
- NTSC video defaults to 4:3
- HDTV 1080i video defaults to 16:9

Contrast

From the **Input Menu**, select **Contrast** to change the contrast of the selected input.

- **Adjustment range**: 75.0% to 125.0%
- **Default**: 100%

Brightness

From the **Input Menu**, select **Brightness** to change the brightness of the selected input.

- **Adjustment range**: 75.0% to 125.0%
- **Default**: 100%

Color Balance

From the **Input Menu**, select **Color Balance** to display one of two available **Color Balance Menus**. The menu that is shown depends on the current input's selected type. Each menu allows you to adjust the input's color balance parameters.

- **RGB Color Balance Menu**
- **Hue/Saturation Color Balance Menu**

RGB Color Balance Menu

If the current input's type is set to **RGB**, the **RGB Color Balance Menu** appears:

Figure 4-10. RGB Color Balance Menu (sample)

Each of the individual contrast and brightness settings operates in conjunction with the "global" contrast and brightness settings in the **Input Menu**.

- **Adjustment range** (all values): -25.0% to +25.0%

- **Default** (all values): 0.0%
- Select **Reset All** to set all values back to their default settings.

Hue/Saturation Color Balance Menu

If the current input's type is set to **Composite**, **S-video**, **YPbPr**, or **SDI**, the **Hue/ Saturation Color Balance Menu** appears:

Figure 4-11. Hue/Saturation Color Balance Menu (sample)

Please note:

- **Hue** is measured in degrees, and is [N/A] for YP_bP_r inputs.
  - ~ **Adjustment range**: -90 to +90
- **Saturation** is measured in percentage.
  - ~ **Adjustment range** (Composite, S-Video): 0% to 150% (100% nominal)
  - ~ **Adjustment range** (SDI, YP_bP_r): 75.0% to 125.0%
- Select **Reset All** to set all values back to their default settings.

Timing Adjust

From the **Input Menu**, select **Timing Adjust** to display the **Timing Adjust Menu**. The menu changes *slightly*, depending on the selected sampling mode (1:1 or Oversample). This menu allows for exact positioning of the input signal's active area.

The figure below illustrates the **Timing Adjust Menu**:

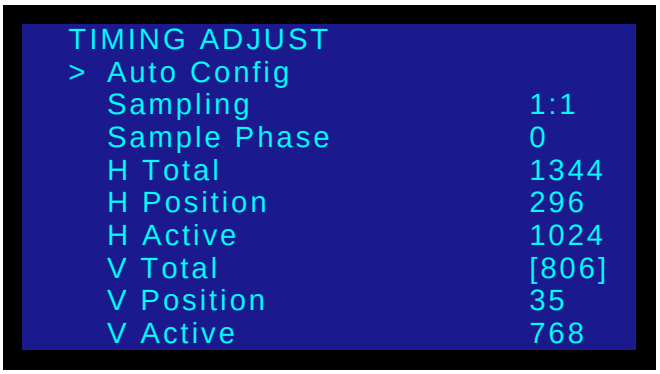


Figure 4-12. Timing Adjust Menu (sample)

The following functions are available:

- **Auto Config** — This function is identical to the **Auto Config** function located in the **Image Adjust Menu**.

Select **Auto Config** to perform an automatic input configuration on the selected source.

Note

In this mode, for the selected image, the system finds the first and last pixel on each edge, and ensures (to the best possible extent) that the entire image is visible. In addition, if the input is analog, the system automatically phases the input to determine the correct sampling phase.

Tip

Ensure that there are non-black pixels around the extreme edges of your active video, in order for the image to be properly sized by the **Auto Config** function. For example, if you use a Windows desktop with a high luminance background, the **Auto Config** function will be accurate. If, on the other hand, you use a desktop image with a black border, the image will not be properly sized.

- **Sampling** — select this function to change the sampling for the selected input. Available values are: **Oversample** and **1:1** (default). Please note:
  - ~ When **1:1 Sampling** is selected, the system provides pixel-for-pixel sampling, and generally better image quality.
  - ~ When **Oversample** is selected, the system performs multiple samples for every pixel, with a resulting "softer" image.
  - ~ **Oversample** is only available for RGB and YP_bP_r analog inputs.
  - ~ All other input types have defined sample clocks that are inherently **1:1**. If the input is set to one of the other types, the value is **[1:1]**.
- **Sample Phase** — This selection is only available when **Sample Mode** is **1:1** and the input is analog RGB or YP_bP_r. If **Oversample** is selected, the field is hidden.

  The sample phase value is initially filled in by the **Auto Config** command, or set to the default value. You can further fine-tune the image by adjusting the sample clock phase directly.
  - ~ **Adjustment range**: -16 to 15
  - ~ **Default**: 0

For all **Horizontal** "active area" fields, all units are measured in pixels:

- **H Total** — adjusts the total pixel count per line. This value cannot be adjusted if the input type is **DVI** / **SDI**.
- **H Position** — adjusts the offset of start of active area from H sync.
- **H Active** — sets the size of the active area.

For all **Vertical** "active area" fields, all unit are measured in lines.

- **V Total** — indicates the total line count per frame. This value is measured, and can never be adjusted. Its value will always be shown in brackets.
- **V Position** — sets the offset of start of active area from V sync.
- **V Active** — sets the size of the active area.

Processing

From the **Input Menu**, select **Processing** to display the **Processing Menu**:

Figure 4-13. Processing Menu (sample)

The following functions are available:

- **Sync Selection** — This function applies only to **Analog RGB** inputs. The digital input sources have embedded syncs, and the composite, S-video, and YP_bP_r inputs always take sync from the Y (or composite) channel. For these digital inputs, the value field indicates **[N/A]**.

  The sync choices are **Auto**, **H/V** (horizontal/vertical sync), **CSync** (composite sync) and **SOG** (sync on green).

  ~ In **Auto** mode, the system finds sync in any of the three possible sources.
    - If one of the sources is chosen, the system uses only that input as a sync source.
    - If the system does not find sync at that source, it acts as if it is in **Auto** mode.

  ~ The default selection for Analog RGB inputs is **Auto**.

- **Pulldown Compensation** — This function only applies to standard video (component, s-video, composite and SD/HD SDI) inputs. The mode, which detects the 3:2 film pulldown sequence, should be turned **ON** to properly process video derived from film source material.

  ~ **Adjustment range**: OFF, ON

  ~ **Default**: OFF

- **Sync Slice** — This function selects the sync comparator threshold for RGsB (RGB with Sync on Green) or YP_bP_r analog component video sources. When ACS-2048 detects Macrovision copy protection on the incoming YP_bP_r NTSC/PAL video, the **Sync Slice** value is automatically repositioned to 60mV to account for the reduced amplitude sync pulse.

  ~ **Adjustment range**: 20mV to 280mV, adjustable in steps of 10mV

  ~ **Default**: 160mV

Save Input Config

From the **Input Menu**, select **Save Config** to save the input configuration for the currently selected input. A confirmation message is briefly displayed, after which the system returns to the **Input Menu**.

Figure 4-14. Saving Input Configuration Message

Please note the following important points regarding input configuration files:

- The ACS-2048 supports one **Input Configuration File** for each physical input. It is not necessary to enter file names or numbers.
- When you perform the **Save Config** function, input configuration parameters are saved in non-volatile memory for each input source. If you *do not* perform the **Save Config** function, data for the selected input will not be restored upon the next system power up sequence.
- If you make a change within the **Input Menu**, and attempt to exit the menu (by pressing **ESC**, **TEST PAT**, or by selecting another input) *without* saving changes, the system displays the following prompt:

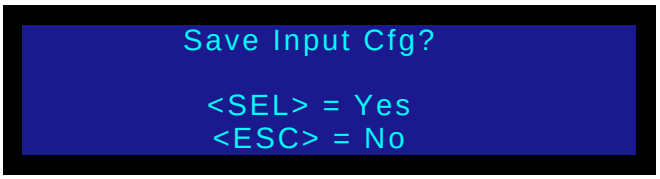


Figure 4-15. Save Input Configuration Prompt

~ Select **Yes** (**SEL**) to save changes.

~ Select **No** (**ESC**) to continue operation without saving the changes.

Reset Config

From the **Input Menu**, select **Reset Config** to remove all user-entered configuration settings from the current input, and restore the input's format parameters from the system's internal library values. When you select the function, you will be prompted to reset (**SEL**) or continue without resetting (**ESC**).

Note that if the current format was derived as a best guess, those "guess" values are restored.

Delete Config

From the **Input Menu**, select **Delete Config** to delete the input configuration for the currently selected input. When you select the function, you will be prompted to delete (**SEL**) or continue without deleting (**ESC**).

If you elect to delete, a confirmation message is briefly displayed, after which the system returns to the **Input Menu**.

Figure 4-16. Deleting Input Configuration Message

Note

Because the input is currently being displayed when **Delete Config** is selected, the system restores the format parameters to their default library values for that input.

Output Menu

From the **Main Menu**, select **Output** to display the **Output Menu**, which enables you to configure the outputs of the ACS-2048.

Figure 4-17. Output Menu (sample)

Following are descriptions of each **Output Menu** function:

- **Output Format**
- **Output Mode**
- **Gamma**
- **Test Pattern**
- **Output Adjust**
- **Save Output Config**

Output Format

From the **Output Menu**, select the top **Output Format** line to view or change the current output format. This line indicates the format in the following form:

`Hact x Vact @ Vr Hz`

Two output formats can be set for the ACS-2048:

- 2048x1080p @ 59.94Hz
- 2048x1080p @ 50Hz

Note	The output format is not updated until **SEL** is pressed.

Output Mode

From the **Output Menu**, select **Output Mode** to change the selected output mode between 8-bit, 10-bit or 12-bit output.

- **Adjustment range**: 8-bit, 10-bit or 12-bit output
- **Default**: 10-bit (this mode requires connecting both outputs to the projector)

Please note the following points regarding the ACS-2048's two DVI-I output connectors:

- In 10-bit or 12-bit mode, both outputs (A and B) must be connected to the projector. In 8-bit mode, a connection is required from Connector A only.
- **Connector A**: Only 8-bit output mode can be selected on this connector, providing standard 8-bit DVI output.

- **Connector B**: To increase color depth, 10-bit or 12-bit output mode can be selected on this connector.

Gamma

From the **Output Menu**, select **Gamma** to specify the Gamma associated with the current output.

- **Adjustment range**: 1.0 to 3.0, in steps of 0.1
- **Default**: 1.0

Test Pattern

From the **Output Menu**, select **Test Pattern** to display the **Test Patterns Menu**:

Figure 4-18. Test Patterns Menu (sample)

Note

If the **Menu Context** mode is **ON** in the **User Preference Menu**, the **Test Patterns Menu** appears whenever the **TEST PAT** button is pressed, allowing you to select an internal test pattern and adjust additional test pattern parameters.

The following functions are available:

- **Mode** — This function enables or disables the test pattern generator.
  - When the mode is turned **ON**, the **TEST PAT** button lights, and the currently selected input drops to its backlit state (depending on sync).
  - When the mode is turned **OFF**, the **TEST PAT** button turns off, and the last selected input will either be lit bright or blinking (depending on sync). The **Test Pattern Menu** remains on the display.

Note

Within this menu, the **TEST PAT** button to turn off the mode, the system returns to the **Main Menu**. Refer to the "**Using Test Patterns**" section on page 70 for details.

- **Type** — This function enables you to select a test pattern. Available choices are:
  - Off
  - H Ramp
  - V Ramp
  - 100% Col Bars
  - 16 x 16 Grid
  - 32 x 32 Grid
  - Burst

- ~ 75% Col bars
- ~ 50% Gray
- ~ Gray Steps 1
- ~ Gray Steps 2

- **Raster Box** — This function enables or disables the raster box.
  - ~ When turned **ON**, the system displays a one-pixel border around the active output area. Note that the raster box includes gaps that enable you to precisely align the input video to fill the output raster.
  - ~ When turned **OFF**, the output is clean, without the border.

Output Adjust

From the **Output Menu**, select **Output Adjust** to scale the entire output to fit the theatre's physical setup (e.g., curtains, drapes, and off-axis projection).

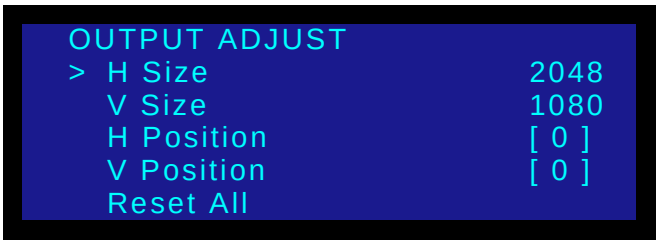


Figure 4-19. Output Adjust Menu (sample)

This adjustment must be performed while you view the projector's output on your screen. When you enter this menu, a solid white raster box appears at the size and position specified within the menu. The selected input is temporarily turned off, and the output video is black. As you adjust H and V size and position, the raster box adjusts accordingly. When you exit the menu, the raster box is cleared, and the selected input will be scaled to fit within this exact size and position.

The following functions are available:

- **H Size** — adjusts the horizontal size in pixels.
- **V Size** — adjusts the vertical size in lines.
- **H Position** — this field is bracketed when **H Size** is 2048. When you adjust **H Size** below 2048, this field becomes active, enabling you to adjust horizontal position in pixels. Positioning is limited to the overall 2048 "space," and the image cannot be moved off screen.
- **V Position** — this field is bracketed when **V Size** is 1080. When you adjust **V Size** below 1080, this field becomes active, enabling you to adjust vertical position in lines. Positioning is limited to the overall 1080 "space," and the image cannot be moved off screen.
- **Reset All** — resets H and V Size to 2048 x 1080, and H and V Position to [0].

Save Output Config

From the **Output Menu**, select **Save Config** to save the current output configuration. A message is briefly shown, after which the system returns to the **Output Menu**.

Figure 4-20. Saving Output Configuration Message

Please note the following important points regarding the output configuration file:

- When you perform the **Save Config** function, all configuration parameters from the **Output Menu** are saved in non-volatile memory. If you *do not* perform the function, output data will not be restored upon the next system power up.
- If you make a change in the **Output Menu**, and attempt to exit the menu (by pressing **ESC** or **TEST PAT**) *without* saving changes, the system displays the following prompt:

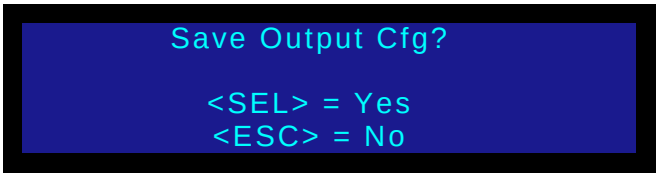


Figure 4-21. Save Output Configuration Prompt

~ Select **Yes** (**SEL**) to save changes.

~ Select **No** (**ESC**) to continue operation without saving the changes.

System Menu

From the **Main Menu**, select **System** to display the **System Menu**, which enables you to to adjust transition times, VFD Brightness, and other “system” related functions:

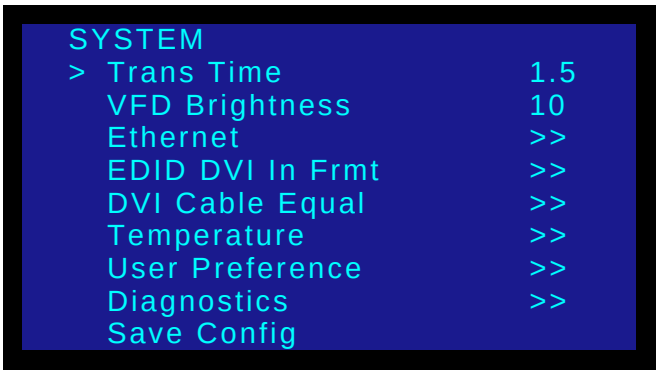


Figure 4-22. System Menu (sample)

Following are descriptions of each **System Menu** function:

- **Trans Time**
- **VFD Brightness**
- **Ethernet**
- **EDID DVI Input Format**
- **DVI Cable Equalization**
- **Temperature**
- **User Preference**
- **Diagnostics**
- **Save System Config**

Trans Time

From the **System Menu**, select **Trans Time** to change the current transition rate that is used when you switch between inputs. Please note the following points:

- The transition type is fixed as "**Transition to Black**." When you change inputs, the current input fades to black, then the new input's video transitions up at the selected **Trans Time**.
- The transition time is defined as the total time required for the system to fade to black, switch to the new input, and fade up to the new input.

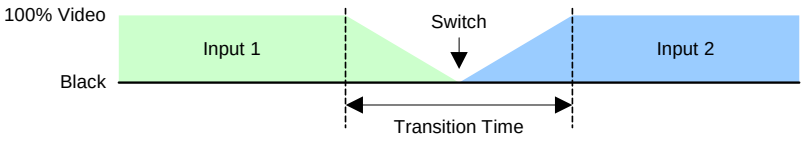


Figure 4-23. Transition Time Diagram

Note that transition times are specified for switching applications with **Auto Acquire** turned **OFF**. When **Auto Acquire** is **ON**, the transition time is greater, due to the additional time required to analyze the input video timing.

Transition values are listed below:

- **Adjustment range**: 1.5 - 5.0 seconds
- **Default**: 2.0 seconds

VFD Brightness

From the **System Menu**, select **VFD Brightness** to control the intensity of the front panel VFD (vacuum fluorescent display).

- **Adjustment range**: 1 - 15 (1 is the dimmest setting)
- **Default**: 10

Note

It is recommend that you use a low intensity setting to avoid "burn-in" of the display.

Ethernet

From the **System Menu**, select **Ethernet** to display the **Ethernet Menu**:

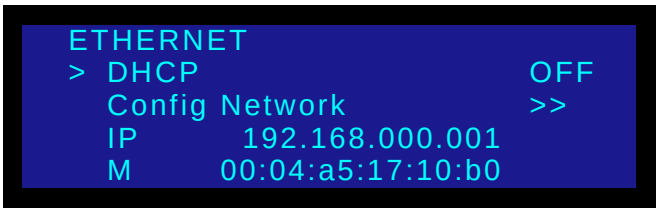


Figure 4-24. Ethernet Menu (sample)

The following Ethernet functions are available:

- **DHCP** — DHCP can be turned **OFF** or **ON**.
  - ~ When **OFF**, the **Config Network** field appears, which enables you to manually enter a static IP address, Subnet mask and Gateway.

Note

Always consult with your network administrator to obtain valid IP, subnet mask and gateway addresses.

  - ~ When **ON**, the ACS-2048 queries the DHCP server for a valid IP address, and the **Config Network** field is hidden.
    - If the ACS-2048 finds a DHCP server and receives an IP address, the address is displayed.
    - If a server is not found, an IP address is not assigned.

- **Config Network** — select this function to display the **Config Network Menu**, which enables you to choose the specific Ethernet address you wish to change.

Figure 4-25. Config Network Menu

~ Select **Set Static IP** to display the **Static IP Menu**, which enables you to set a static IP address when a DHCP server is not available. The editing procedure is discussed below.

Figure 4-26. Static IP Menu

~ Select **Set Netmask** to display the **Netmask Menu**, which enables you to set a netmask. The editing procedure is discussed below.

Figure 4-27. Netmask Menu

~ Select **Set Gateway** to display the **Gateway Menu**, which enables you to set a gateway. The editing procedure is discussed below.

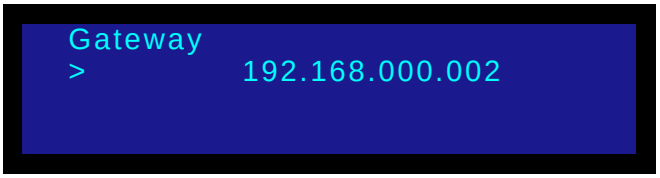


Figure 4-28. Gateway Menu (sample)

Use the following steps to edit the IP address, Netmask or Gateway. Valid fields range from 000 to 255.

a. Press **SEL** to begin editing. This action highlights the first digit, and displays the carat "**^**."

b. Use the **ADJUST** knob to move the carat left and right through the address.

c. When the desired digit is highlighted, press **SEL** to edit the value. The carat changes to the pound sign "**#**."

d. Use the **ADJUST** knob to select the desired value (0 - 9).

e. Once the value is selected, press **SEL** to "accept" the new value. The pound sign "**#**" changes back to the carat "**^**."

f. Repeat the process from step **b** for all additional digits that you wish to change.

g. When all editing is complete, press **ESC** to display the **Apply Changes Menu**.

- Select **Yes** (**SEL**) to apply all changes.
- Select **No** (**ESC**) to exit the procedure without saving changes.

In each case, system returns to the root menu (Static IP, Gateway, or Netmask).

When Ethernet setup is complete, you can communicate with the ACS-2048 via the Ethernet. Refer to the "**Remote Commands**" section on page 98 for details.

- **IP Address** — The **IP** line is an information-only line that shows the current IP address in all modes (with DHCP on or off). If an IP address has not been established (no DHCP server found, or the network cable is not connected), the address reads "**000.000.000.000**."

Note	The ACS-2048's default IP address is **192.168.0.1**.

- **MAC Address** — The **M** line is an information-only line that shows the MAC (hardware) address of the unit's Ethernet port.

EDID DVI Input Format

From the **System Menu**, select **EDID DVI In Frmt** to display the **EDID DVI Input Format Menu**, which enables you to update the preferred EDID resolution for the ACS-2048's two DVI inputs (**2** and **3**).

Figure 4-29. EDID DVI Input Format Menu (sample)

Important	This menu is designed for advanced users only. Do not reprogram EDID unless it is necessary.

EDID (Extended Display Identification Data) is a VESA standard data format that contains information about a display device and its capabilities, including the preferred (as well as the allowed) device resolutions.

The ACS-2048's EDID file is stored in non-volatile memory. This file is read by a computer's DVI graphics card during boot-up, when its DVI output is connected to a DVI-I input connector on the ACS-2048 system (inputs **2** and **3**). The ACS-2048 must be powered on first for the EDID information to be read.

The following functions are available:

- **Input** — selects the exact inputs that you wish to program: **ALL** (inputs 2 and 3), **2** (individually), or **3** (individually).
- **EDID Format** — This line displays the system's current EDID format, and enables you to select a new EDID format to program into non-volatile memory. As required, press **SEL** to scroll through the formats.
- **Program EDID** — Select this function to program the preferred DVI resolution, as defined on the **EDID Format** line. When **SEL** is pressed, the following message is briefly displayed.

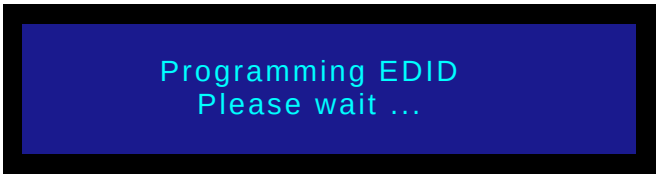


Figure 4-30. Programming EDID Message 1

If the non-volatile memory programming is successful, the following message is displayed:

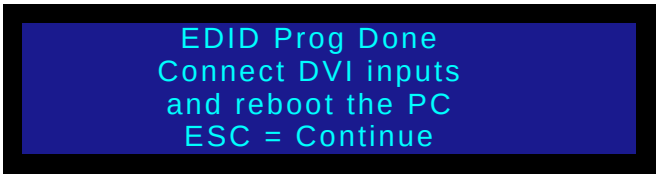


Figure 4-31. Programming EDID Message 2

Note

At this point, reboot the external computer(s) in order for the new EDID information to be read, and the new preferred resolution to become available.

If the EDID programming failed, the following message will be displayed:

Figure 4-32. EDID Programming Failed Message

If this message persists, please contact customer service for technical support.

DVI Cable Equalization

From the **System Menu**, select **DVI Cable Equal** to display the **DVI Cable Equalizer Menu**, which enables you to adjust input cable equalization parameters for both DVI inputs simultaneously, or individually for inputs **2** or **3**.

Figure 4-33. DVI Cable Equalizer Menu (sample)

The following functions are available:

- **Input** — selects the exact inputs that you wish to set: **ALL** (inputs 2 and 3), **2** (individually), or **3** (individually).
- **Equalization** — The equalization adjustment range is from **0** (short cable equalization) to **15** (long cable equalization). The default value is **12**, which indicates “moderate” equalization.

  In general, the default should be adequate for most users, unless cables longer than 5M are used, and unless your signals are running at high pixel clock rates (e.g., UXGA).
- **Set to Default** — returns the equalization settings to their default values.

Note

Equalization is a subjective “visual” adjustment, which depends on three important factors: cable length, signal quality and cable quality. If you adjust the equalization, optimize the setting for the lowest amount of visual artifacts.

Temperature

From the **System Menu**, select **Temperature** to display the **System Temperature Menu**.

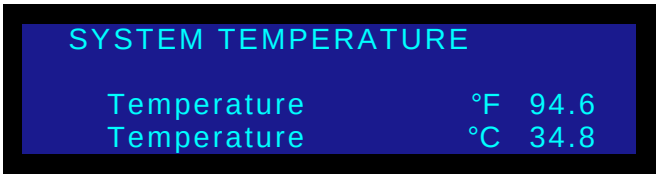


Figure 4-34. System Temperature Menu (sample)

The **System Temperature Menu** is an information-only display that indicates the chassis’ internal temperature in both celsius and farenheit. When the menu is displayed, temperature values update every 4 seconds.

Note that the ACS-2048 measures the internal temperature for an “over-temp” condition every 5 minutes. If the system’s internal temperature exceeds 122° F (50° C), the following message appears:

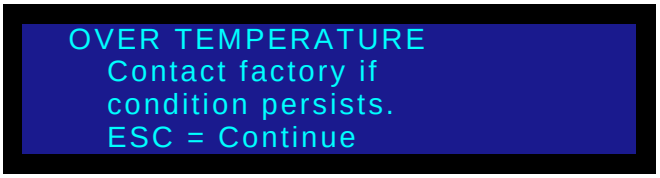


Figure 4-35. Over Temperature Warning

To clear the message and continue operations, press **ESC**.

Note

This message is a warning only, which does not prevent the operation of the ACS-2048. If this message appears, it is recommended that you contact Barco Customer Service.

User Preference

From the **System Menu**, select **User Preference** to display the **User Preference Menu**:

Figure 4-36. User Preference Menu (sample)

The following functions are available:

- **Auto Input Save** — When enabled, the system automatically saves the selected input after it has been acquired for the first time. The field has no effect if the **Auto Acquire** mode is **OFF**.
- **All Inputs Sel** — This preference tells the system to allow (or disallow) the selection of inputs that do not have a valid sync signal detected.
  - ~ When **ON**, you can select inputs that do not have valid sync (and are not backlit).
  - ~ When **OFF**, you cannot select inputs that do not have valid sync, and the “**Invalid Selection**” message will be displayed if you attempt to do so.
- **Menu Context** — This preference determines the behavior of certain ACS-2048 menus. The following conditions apply:
  - ~ When **Menu Context** is **ON**, regardless of the menu currently being displayed, menus automatically change their context when an **Input** or the **TEST PAT** button is pressed.
    - ▲ **Example**: The **Status Menu** is currently displayed. When you select a different input, the **Input Menu** is immediately displayed for that input.

▲ **Example**: The **Status Menu** is currently displayed. When you press **TEST PAT**, the **Test Patterns Menu** is immediately displayed.

~ When **Menu Context** is **OFF**, menu context does not change when an **Input** or the **TEST PAT** button is pressed.

Diagnostics

From the **System Menu**, select **Diagnostics** to display the **Diagnostics Menu**:

Figure 4-37. Diagnostics Menu

If you suspect a problem with the ACS-2048, press **SEL** to run a series of internal diagnostic tests. The menu will report back "**PASS**" or "**FAIL**."

Note

If the menu report "**FAIL**," please contact Barco Customer Service. They will assist you with troubleshooting.

Save System Config

From the **System Menu**, select **Save Config** to save all current "system" settings so that they may be restored at power up. A message is briefly shown, after which the ACS-2048 returns to the **System Menu**.

Figure 4-38. Saving System Configuration Message

Please note the following important points regarding the system configuration file:

- When you perform the **Save Config** function, all configuration parameters from the **System Menu** are saved in non-volatile memory. If you *do not* perform the function, data will not be restored upon the next system power up sequence.
- This command also saves the currently selected **input** channel as the default selection upon power up.

Note

If you want the ACS-2048 to always power up and acquire an input other than input 1, perform the **Save System State** command while the desired input is selected.

- If you *do not* perform the **Save System State** function, data will not be restored upon the next system power up sequence.

- If you make a change in the **System Menu**, and attempt to exit the menu (by pressing **ESC**, **TEST PAT**, or by selecting another input) *without* saving changes, the system displays the following prompt:

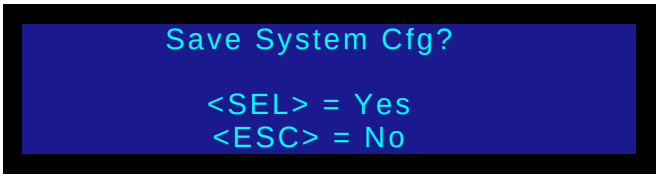


Figure 4-39. Save System Configuration Prompt

~ Select **Yes** (**SEL**) to save changes.

~ Select **No** (**ESC**) to continue operation without saving the changes.

Status Menu

From the **Main Menu**, select **Status** to display the **Status Menu**:

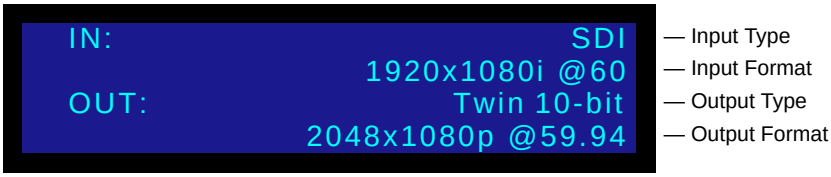


Figure 4-40. Status Menu (sample)

The **Status Menu** provides information about the currently selected system input and output. The input section always reflects the selected input channel, as determined by the input buttons. Please note:

- If **Menu Context** is **ON** (on the **User Preference Menu**), selecting a different automatically displays the **Input Menu**. The **Status Menu** will be updated with new data the next time you access it.
- If **Menu Context** is **OFF**, the **Status Menu** remains on display when you select a different input, and it automatically updates with the input's new status. Press **ESC** to return to the **Main Menu**.

In the **Status Menu**, the variable fields are as follows:

- **Input Type** — Specifies the type of input signal being processed.
- **Input Format** — Indicates the current input video format in the form:

  `Hact x Vact @ Vr Hz`

  ▲ 1280x1024@60 Hz

  If the currently selected input does not have a valid input signal, the **Input Format** field displays "**Invalid Signal**."
- **Output Type** — indicates the selected output type, as well as HCDP status. The following labels can appear, depending on the output and HDCP implementation:

  ~ 8-bit
  ~ 8-bit HDCP
  ~ Twin 10-bit
  ~ Twin 10-bit HDCP
  ~ Twin 12-bit
  ~ Twin 12-bit HDCP
  ~ HDCP Violation

Important

If the label "**HDCP Violation**" appears, it indicates that an HDCP source is selected, but a non-HDCP compliant monitor or device (such as an HDCP repeater) has been detected. In this situation, video output is disabled.

- **Output Format** — Indicates the current output video format in the form:

  `Hact x Vact @ Vr Hz`

  ▲ 2048x1080@59.94 Hz

Software Version

From the **Main Menu**, select **Software Version** to display the **Software Version Menu**:

Figure 4-41. Software Version Menu

The version shown is the current version of installed operating firmware. This number changes when you update system software. In Chapter 5, refer to the "**Software Upgrade Overview**" section on page 74 for software update instructions.

Factory Reset

From the **Main Menu**, select **Factory Reset** to display the **Factory Reset Menu**:

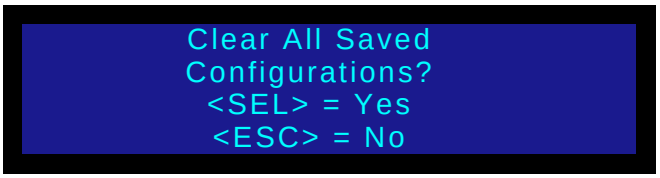


Figure 4-42. Factory Reset Menu

This function enables you to reset the ACS-2048 to its factory default condition, in which all input, output and system configuration files are deleted. When the command is executed, a confirmation menu is shown.

- Press **SEL** to reset the system.
- Press **ESC** to cancel the operation, and return to the **Main Menu**.

The following attributes constitute a "factory default" condition:

- The **TEST PAT** button is selected.
- All "Sync Present" states are shown correctly (backlit buttons).
- The **Output** is set to 2048x1080@59.94.
- The **Output Raster Box** is **OFF**.
- The **Main Menu** is displayed.
- All menu items are set to their default values (as specified throughout this chapter).

Using Inputs

This section provides background information and instructions for using inputs. The following topics are discussed:

- **Understanding Backlighting**
- **Input Selection Rules**
- **Understanding Auto Acquire**

Understanding Backlighting

The backlighting of the input buttons reflects sync detection, as follows:

- **Off** — indicates that sync has not been detected on the input connector, and the input cannot be used on air. The input is **invalid**.
- **Dim Yellow** — (or backlight on) indicates that sync has been detected, and the source is available (valid) for use on air. The input is **valid**.
- **Bright Yellow** — indicates the currently selected "on air" source.
- **Blinking** — indicates that sync has been lost from the current "on air" source. In this situation, internal "black" will automatically replace the previous on air source, and the source cannot be used on air until sync is restored.

Input Selection Rules

Please note the following important rules regarding input selection:

- Each input that you select will be routed to the output, using the current transition rate (as entered on the **System Menu**).
- When you press a button for a valid input (sync is detected and the button is backlit), the ACS-2048 immediately transitions to the selected input.
  - ~ If **Menu Context** is **ON** (in the **User Preference Menu**), the **Input Menu** appears.
  - ~ If **Menu Context** is **OFF**, the current menu remains.
- If you press an unlit input button (sync is not detected), the following message appears:

Figure 4-43. Error message: No Sync Detected

- **Input 8** is currently not implemented. If the input button is pressed, the following message appears:

Figure 4-44. Error message: Invalid Selection

- Remember that the **Menu Context** option on the **User Preference Menu** affects the way that menus are displayed. Refer to the "**User Preference**" section on page 63 for details.

Understanding Auto Acquire

Please note the following important points regarding the **Auto Acquire** mode:

- If **Auto Acquire** is **ON** and a valid input is selected that does *not* have a saved **Input Config** file associated with it, the system attempts to acquire the source, save an **Input Config** file, and smoothly transition to the new source.

Note

The **Input Config** file will only be saved if the "**Auto Input Save**" mode is **ON** in the **User Preference Menu**.

- If **Auto Acquire** is **OFF** and a valid input is selected (either with or without a saved **Input Config** file), the system compares the library file to the input's incoming timing.
  - ~ If the timings match, the system transitions to the input.
  - ~ If the timings do not match, the system displays black and the "**Invalid Signal**" message appears.
- One of three "auto acquire" conditions can exist when the new (unsaved) input is selected, as listed in the following table:

Table 4-1. Auto Acquire Conditions and Actions

System Condition when a new (unsaved) input is selected	User Action	System Action
Condition 1: No source is currently selected, and the output is black. This condition occurs after a Factory Reset.	Select a source	Once the "auto acquire" is complete, the system transitions to the new source.
Condition 2: Another source is currently showing on the output.	Select a source	The system transitions to black. Once the "auto acquire" of the new source is complete, the system transitions to the new source.
Condition 3: A **Test Pattern** is showing on the output.	Select a source	The system transitions the test pattern off, and then follows the rules outlined for conditions 1 or 2 — depending on the current situation.

Using Test Patterns

Pressing the **TEST PAT** button selects the internal test pattern as the ACS-2048's source. There are two ways to use the button:

- When **TEST PAT** is pressed, the button lights, and the internal test pattern is routed to the output. When you select another input, the system transitions to the new input.
- When the **TEST PAT** button is already lit, press the **TEST PAT** button again to toggle back to the last selected input.

Note

If the **Menu Context** mode is **ON** in the **User Preference Menu**, the **Test Patterns Menu** appears whenever the **TEST PAT** button is pressed, allowing you to select an internal test pattern and adjust additional test pattern parameters.

Please note the following important points regarding test pattern usage:

- When **Menu Context** is **ON** and **TEST PAT** is pressed, the last selected test pattern is automatically enabled, and the Type field is selected, enabling you to change patterns easily.
- If you need to change the state of the Raster Box in this mode, press **ESC**, scroll to the **Raster Box** field, and change the function as required.
- Regardless of the **Menu Context** mode, pressing **TEST PAT** has no effect on the state of the Raster Box. It always remains in its last selected mode.

Front Panel Lockout

The ACS-2048 includes a front panel lockout mode which when enabled, locks out the front panel from all source selections, including the Test Pattern.

- Use the following steps to lock (and unlock) the front panel:

  1. Press and hold the **SEL** and **ESC** buttons for 3 seconds. Once this button combination has been detected, the following display appears:

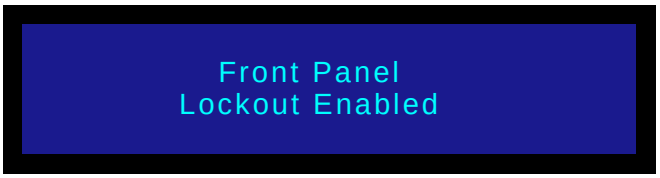


Figure 4-45. System message: Lockout Enabled

In the “lockout” mode:

- ~ All button pushes and all turns of the rotary knobs will be ignored.
- ~ All Ethernet communications and commands will function normally.
- ~ All button lights will continue to reflect the proper state of the inputs.

2. To disable the front panel lockout mode, press and hold the **SEL** and **ESC** buttons for 3 seconds. Once detected, the system returns to the previous menu that was shown before the “lockout” mode was enabled.

5. Upgrading Software

In This Chapter

This chapter provides detailed instructions for upgrading ACS-2048 system software. The following topics are discussed:

- **Software Upgrade Overview**
- **Hardware Requirements**
- **Software Requirements**
- **Downloading Software**
- **Ethernet Upgrade Method**

Software Upgrade Overview

Firmware files for the ACS-2048 are loaded into the hardware at power-up. These files are stored in the unit's onboard flash memory.

The ACS-2048's system software can be easily upgraded using the following steps:

- Downloading the appropriate "upgrade" file from the Barco FTP site or website
- Connecting a PC (or laptop) to the ACS-2048
- Launching a web browser
- Connecting to the ACS-2048 using its IP address
- Following the upgrade instructions in the browser

Hardware Requirements

The following hardware items are required for upgrading ACS-2048 software:

- IBM compatible computer with an available Ethernet port.
- Local Ethernet network, including an Ethernet switch

Software Requirements

The following list outlines software requirements for upgrading ACS-2048 software:

- Ensure that your PC (or laptop) uses the Windows® 2000 or XP operating systems.
- Ensure that your PC (or laptop) has a web browser installed, such as Windows Internet Explorer® or Mozilla Firefox®.

Software files can be downloaded from either the Barco Folsom FTP site or the Barco website, as described in the following "**Downloading Software**" section.

Downloading Software

Two different methods can be used to download ACS-2048 software:

- **Via FTP Site**
- **Via Web Site**

Via FTP Site

Barco Folsom's FTP site address is: **ftp.folsom.com**

- To download software from the FTP site:

1. Create a target folder on your PC (e.g., ACS-2048).
2. Ensure that your PC is connected to the internet.
3. There are three ways to log on to the FTP site:
   a. If you are using an FTP client such as **Ipswitch WS_FTP Professional**, logon to our site as follows:
      - **FTP Site**: ftp.folsom.com
      - **User name**: anonymous
      - **Password**: your email address

      ▲ **Example**: johndoe@somecompany.com

   b. If you are using a web browser, point the browser to:

      ftp://ftp.folsom.com

Note

If you are using **Internet Explorer 7**, after entering the FTP address, click **Page**, and then click **Open FTP Site in Windows Explorer**.

   c. To use Windows Explorer, right-click the **Start** button, then click **Explore**. When the Explorer window opens, enter the FTP site in the address bar.
4. Once logged on, navigate to the following directory:

   ftp://ftp.folsom.com/Image Processing/ACS-2048/
5. Transfer the following file to the target folder on your PC:

   ACS2048_##_##.tar.gz
6. Please continue with the "**Ethernet Upgrade Method**" section on page 76.

Via Web Site

Barco's web site address is: **www.barco.com**

- To download software from the web site:

1. Create a target folder on your PC (e.g., ACS-2048).
2. Ensure that your PC is connected to the internet.
3. On the web, navigate to:

   http://www.barco.com

4. Navigate to the “Digital Cinema” home page:

   http://www.barco.com/digitalcinema/

5. Log in to the **Barco Partnerzone**.
6. Navigate to the “**Software Updates**” link, and download the latest version of code:

   ACS2048_##_##.tar.gz

7. When the **File Download Dialog** appears, click **Save**.
8. When the **Save As Dialog** appears, navigate to the target folder and click **Save**.
9. Please continue with the “**Ethernet Upgrade Method**” section on page 76.

Ethernet Upgrade Method

- Use the following steps to upgrade ACS-2048 software:

1. Ensure that your PC (or laptop) uses the Windows® 2000 or XP operating systems.
2. Connect the ACS-2048’s Ethernet port to a Switch.
3. Connect the Switch to your PC (or laptop).
4. Power-up the ACS-2048.
5. Note the ACS-2048’s *current* IP address:
   a. From the **Main Menu**, select **System** to display the **System Menu**.
   b. From the **System Menu**, select **Ethernet** to display the **Ethernet Menu**.
   c. Make a note of the information on the **IP** line, which shows the current IP address in all modes (with DHCP on or off).

Note The default IP address is **192.168.0.1**.

6. On your PC (or laptop), open up a web browser.
7. In the browser’s address bar, enter the ACS-2048’s IP address.

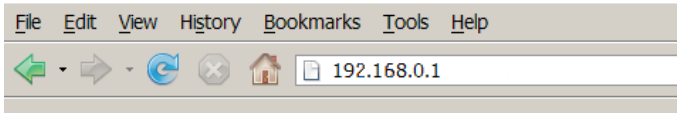


Figure 5-1. Address bar with sample IP address

8. When the PC establishes communications with the ACS-2048, several web pages are downloaded into the PC, and the **ACS-2048 Upgrade Page** appears:

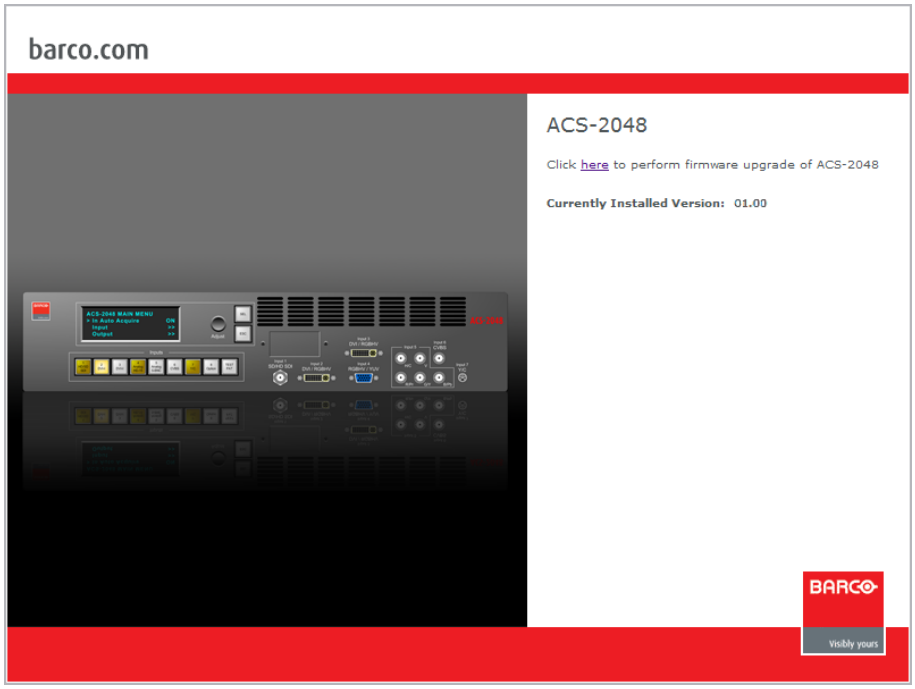


Figure 5-2. ACS-2048 Upgrade Page (sample)

9. Click the **Firmware Upgrade** link to continue the upgrade process. The **Select File** page appears, as shown below:

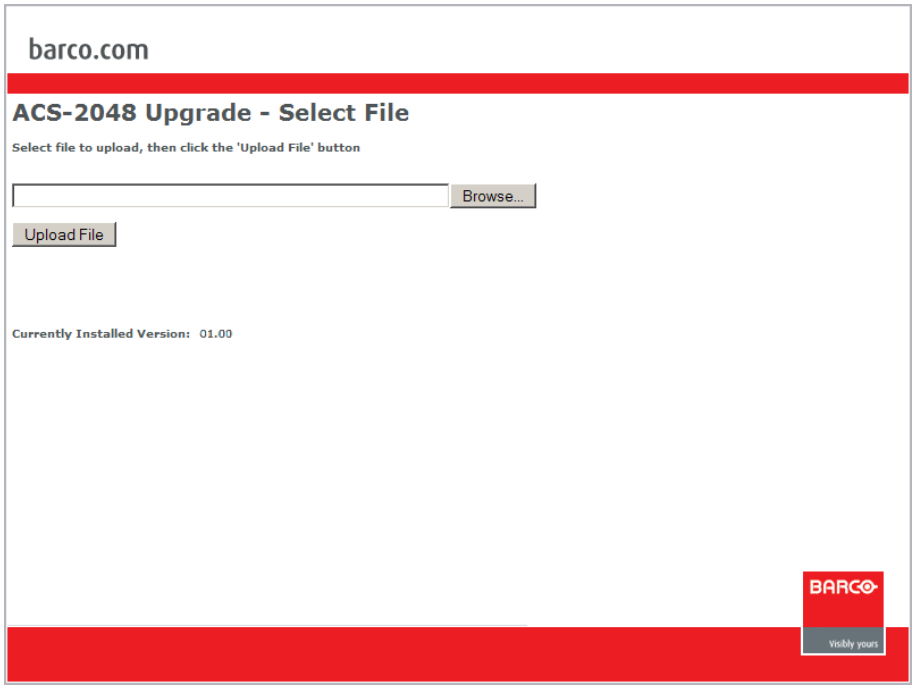


Figure 5-3. ACS-2048 Select File Page (sample)

10. Click the **Browse** button, and navigate to the folder on your PC where you saved the latest version of code.
11. In the **Upload Dialog**, select the file:

    ACS2048_##_##.tar.gz

    ... and click **Open**.
12. In the **Select File** page, click **Upload File**. The **Upload Status** page appears, which provides status during the upload procedure:

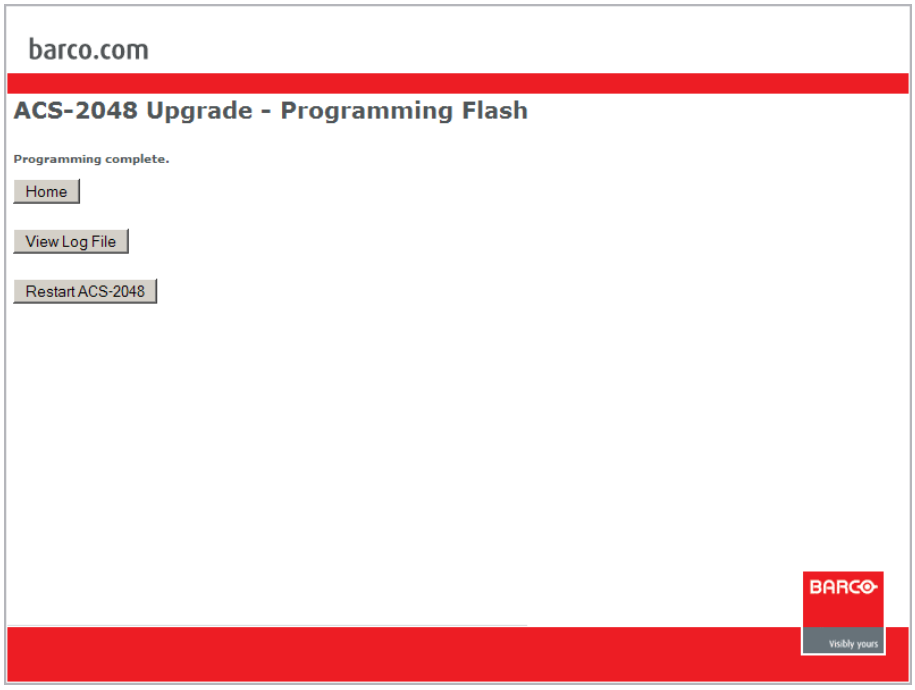


Figure 5-4. ACS-2048 Upload Status Page (sample)

13. When the procedure is complete, you have three options:
    - ~ Click **Home** to return to the ACS-2048 **Upgrade Page**.
    - ~ If a problem was encountered during the process, click **View Log File** to display a text-based log of the upload procedure.
    - ~ If the upload was successful, click **Restart ACS-2048** to complete the entire procedure.
14. Close your browser, and resume operations on the ACS-2048. Be sure to check the **Software Version Menu** to verify that the system has been updated. From the **Main Menu**, select **Software Version** to display the **Software Version Menu**.

Troubleshooting Ethernet Communication

- Use the following steps to determine the IP address of the ACS-2048, and establish proper communications:

  1. Power-up the ACS-2048.
  2. Note the ACS-2048's *current* IP address:
     - **a.** From the **Main Menu**, select **System** to display the **System Menu**.
     - **b.** From the **System Menu**, select **Ethernet** to display the **Ethernet Menu**.
     - **c.** Make a note of the information on the **IP** line, which shows the current IP address in all modes (with DHCP on or off).
  3. Attempt to ping the ACS-2048 as follows:
     - **a.** Connect the ACS-2048's Ethernet port to a Switch.
     - **b.** Connect the Ethernet Switch to your PC.
     - **c.** Turn on the PC or laptop.
     - **d.** Open a command prompt window on the PC. Click **Start > Programs > Accessories > Command Prompt**.
     - **e.** On the command prompt line, type:

       ```
       ping 192.168.0.1
       ```

       ... followed by **Enter**.

Note

> Use the unit's actual IP address, as determined in step **2** above.

     - **f.** If the computer is able to successfully communicate with the ACS-2048, you will see a series of "**replies**" from the target IP address. Repeat the upgrade procedure as outlined in the "**Ethernet Upgrade Method** section on page 76".
     - **g.** If you see a "**Request timed out**" message, the PC is unable to locate and communicate with the ACS-2048. If this is the case:
       - Check your network connections and settings as described above, or ...
       - Contact your network administrator, or ...
       - Contact **Technical Support**. In Appendix C, refer to the "**Contact Information** section on page 108 for details.

A. Specifications

In This Appendix

This appendix provides detailed technical specifications for the ACS-2048. The following topics are discussed:

- **Input Specifications**
- **Output Specifications**
- **Physical and Electrical Specifications**
- **Communications Specifications**
- **Agency Specifications**
- **Pinouts**
- **Input Format Table**

Input Specifications

The table below lists ACS-2048 input specifications.

Table A-1. ACS-2048 Input Specifications

Parameter	Detail	Specification
Input 1	Connector	BNC
	Format	SD-SDI per SMPTE 259M-C (NTSC/PAL resolution)
		HD-SDI per SMPTE 292M (HDTV)
Input 2	Connector	DVI-I, per DDWG 1.0
	Format	8-bit DVI, RGBHV data via analog pins
	HDCP hardware support	HDCP version 1.0 compliant
	Composite, S-Video, YUV	Not supported
Input 3	Connector	DVI-I, per DDWG 1.0
	Format	8-bit DVI, RGBHV data via analog pins
	HDCP hardware support	HDCP version 1.0 compliant
	Composite, S-Video, YUV	Not supported
Input 4	Connector	HD-15 VGA
	Format	YUV and RGBHV
	Sampling	10-bits/color at 170 MHz maximum
		Supports 1:1 sampling up to 1600x1200@60 Hz
		Sources with native pixel rates > 170 MHz will be filtered and undersampled at 170 Mhz, including: • 1920x1080p@60 (173.0 MHz) • 1920x1200@60 (193.25 MHz) • 2048x1080p@60 (183.75 MHz)
	Composite, S-Video	Not supported
Input 5	Connectors	5 x BNC
	Format	YUV and RGBHV
	Sampling	10-bits/color at 170 MHz maximum
		Supports 1:1 sampling up to 1600x1200@60 Hz
		Sources with native pixel rates > 170 MHz will be filtered and undersampled at 170 Mhz, including: • 1920x1080p@60 (173.0 MHz) • 1920x1200@60 (193.25 MHz) • 2048x1080p@60 (183.75 MHz)
	Composite, S-Video	Not supported

Table A-1. ACS-2048 Input Specifications (Continued)

Parameter	Detail	Specification
Input 6	Connector	BNC
	Format	NTSC or PAL video (CVBS)
Input 7	Connector	4-pin mini-DIN
	Format	Encoded NTSC or PAL Y/C video
Input 8	Not currently implemented	

Output Specifications

The table below lists ACS-2048 output specifications:

Table A-2. ACS-2048 Output Specifications

Parameter	Detail	Specification
Outputs	Outputs A and B	Dual channel (Twin-Link) DVI output
	Connectors	2 x DVI
	RGB output	Up to 12-bit / color (4:4:4) • 8 msb on connector A • 4 lsb on connector B
		8-bit output on connector A only (user-selectable)
	HDCP Encryption	Connectors A and B
	Supported frame rates	50Hz, 59.94Hz

Physical and Electrical Specifications

The table below lists ACS-2048 physical and electrical specifications.

Table A-3. ACS-2048 Physical and Electrical Specifications

Parameter	Detail	Specification
Power	Connector	Standard IEC, integral on/off switch
	Power	100-240 VAC, 50-60 Hz
Mechanical	Chassis	**H:** 3.50 inches (8.89 cm)
		W: 17.00 inches (43.18 cm)
		W: 19.00 inches (48.26 cm) with rackmount wings
		D: 10.00 inches (25.4 cm)
Temperature		0-40 degrees C
Humidity		0-95% non-condensing
Mounting		2 RU rack mount
Weight		5.8 lbs (2.63 kg)
Shipping Weight		20 lbs (9.07 kg)

Communications Specifications

The table below lists ACS-2048 communications specifications.

Table A-4. ACS-2048 Communications Specifications

Parameter	Detail	Specification
Communications	Ethernet	RJ-45, 10/100 Mbps

Agency Specifications

The table below lists ACS-2048 agency specifications.

Table A-5. ACS-2048 Agency Specifications

Parameter	Detail	Specification
Agency Specifications	EMI/EMC	EN55103-1 E4, EN55103-2, FCC Part 15 Subpart B Class A
	Safety	EN 60950 Class 1

Pinouts

The following topics are discussed in this section:

- Analog 15-pin D Connector
- DVI-I Connector Pinouts
- Ethernet Connector
- Mini-DIN Connector

Analog 15-pin D Connector

The figure below illustrates the analog 15-pin D connector:

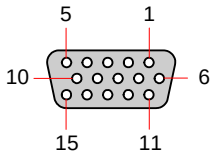


Figure A-1. Analog 15-pin D connector, chassis view

The table below lists Analog 15-pin D connector pinouts.

Table A-6. Analog 15-pin D Connector Pinouts

Pin	Signal	Pin	Signal
1	Red	9	
2	Green	10	GND
3	Blue	11	
4		12	
5		13	H Sync or C Sync
6	Red return	14	V Sync
7	Green return	15	
8	Blue return		

DVI-I Connector Pinouts

The figure below illustrates the DVI-I connector:

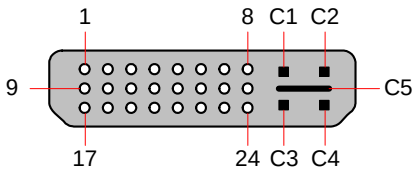


Figure A-2. DVI-I connector

The table below lists DVI-I connector pinouts. Please note:

- T.M.D.S = Transition Minimized Differential Signal
- DDC = Display Data Channel

Table A-7. DVI-I Connector Pinouts

Pin	Signal	Pin	Signal
1	T.M.D.S. Data 2-	13	T.M.D.S. Data 3+
2	T.M.D.S. Data 2+	14	+5V Power
3	T.M.D.S. Data 2/4 Shield	15	ground (for +5V)
4	T.M.D.S. Data 4-	16	Hot Plug Detect
5	T.M.D.S. Data 4+	17	T.M.D.S. Data 0-
6	DDC Clock	18	T.M.D.S. Data 0+
7	DDC Data	19	T.M.D.S. Data 0/5 Shield
8	Analog Vertical Sync	20	T.M.D.S. Data 5-
9	T.M.D.S. Data 1-	21	T.M.D.S. Data 5+
10	T.M.D.S. Data 1+	22	T.M.D.S. Clock Shield
11	T.M.D.S. Data 1/3 Shield	23	T.M.D.S. Clock +
12	T.M.D.S. Data 3-	24	T.M.D.S. Clock -
MicroCross Pins			
C1	Analog Red Video	C4	Analog Horizontal Sync
C2	Analog Green Video	C5	Analog Common Ground Return
C3	Analog Blue Video		

Ethernet Connector

The figure below illustrates the Ethernet connector:

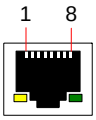


Figure A-3. Ethernet connector

The table below lists Ethernet connector pinouts.

Table A-8. Ethernet Connector Pinouts

Pin	Signal	Wire Color
1	TX Data +	White / Orange
2	TX Data -	Orange
3	RX Data +	White / Green
4		Blue
5		White / Blue
6	RX Data -	Green
7		White / Brown
8		Brown

Mini-DIN Connector

The figure below illustrates the **4 pin Mini-DIN** connector.

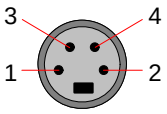


Figure A-4. 4 Pin Mini-DIN connector

The table below lists **Mini-DIN** connector pinouts.

Table A-9. Mini-DIN Connector Pinouts

Pin	DMX Signal	Description
1	C	Chrominance
2	Y	Luminance
3	Gnd	Ground
4	Gnd	Ground

Input Format Table

The table below lists the available input formats for the ACS-2048. Each entry uses the following convention: **Format @Fv (Hz)**.

Table A-10. ACS-2048 Input Formats

Format	Aspect Ratio	Color Space
NTSC (480i)	1.33333	SMPTE, RGB
720x480p	1.33333	SMPTE, RGB
PAL (576i)	1.33333	SMPTE, RGB
720x575p	1.33333	SMPTE, RGB
640x480 @59.94	1.33333	RGB
640x480 @60	1.33333	RGB
640x480 @72	1.33333	RGB
640x480 @75	1.33333	RGB
640x480 @85	1.33333	RGB
800x600 @50	1.33333	RGB
800x600 @56	1.33333	RGB
800x600 @59.94	1.33333	RGB
800x600 @60	1.33333	RGB
800x600 @72	1.33333	RGB
800x600 @75	1.33333	RGB
800x600 @85	1.33333	RGB
1024x768 @47.95	1.33333	RGB
1024x768 @48	1.33333	RGB
1024x768 @50	1.33333	RGB
1024x768 @59.94	1.33333	RGB
1024x768 @60	1.33333	RGB
1024x768 @70	1.33333	RGB
1024x768 @71.93	1.33333	RGB
1024x768 @72	1.33333	RGB
1024x768 @75	1.33333	RGB
1024x768 @85	1.33333	RGB
1152x864 @75	1.33333	RGB
1280x768 @47.95	1.66667	RGB

Table A-10. ACS-2048 Input Formats (Continued)

Format	Aspect Ratio	Color Space
1280x768 @48	1.66667	RGB
1280x768 @50	1.66667	RGB
1280x768 @59.94	1.66667	RGB
1280x768 @75	1.66667	RGB
1280x960 @50	1.33333	RGB
1280x960 @59.94	1.33333	RGB
1280x960 @60	1.33333	RGB
1280x960 @85	1.33333	RGB
1280x1024 @47.95	1.25	RGB
1280x1024 @48	1.25	RGB
1280x1024 @50	1.25	RGB
1280x1024 @59.94	1.25	RGB
1280x1024 @60	1.25	RGB
1280x1024 @71.93	1.25	RGB
1280x1024 @72	1.25	RGB
1280x1024 @75	1.25	RGB
1280x1024 @85	1.25	RGB
1364x768 @47.95	1.77778	RGB
1364x768 @48	1.77778	RGB
1364x768 @50	1.77778	RGB
1364x768 @59.94	1.77778	RGB
1364x768 @75	1.77778	RGB
1364x1024 @47.95	1.33333	RGB
1364x1024 @48	1.33333	RGB
1364x1024 @50	1.33333	RGB
1364x1024 @59.94	1.33333	RGB
1364x1024 @75	1.33333	RGB
1366x768 @50	1.77778	RGB
1366x768 @59.94	1.77778	RGB
1400x1050 @48	1.33333	RGB
1400x1050 @50	1.33333	RGB
1400x1050 @59.94	1.33333	RGB
1400x1050 @60	1.33333	RGB

Table A-10. ACS-2048 Input Formats (Continued)

Format	Aspect Ratio	Color Space
1400x1050 @75	1.33333	RGB
1536x768 @50	2	RGB
1536x768 @59.94	2	RGB
1680x1050 @60	1.6	RGB
1600x1200 @47.95	1.33333	RGB
1600x1200 @48	1.33333	RGB
1600x1200 @50	1.33333	RGB
1600x1200 @59.94	1.33333	RGB
1600x1200 @60	1.33333	RGB
1280x720p @48	1.77778	SMPTE, RGB
1280x720p @50	1.77778	SMPTE, RGB
1280x720p @59.94	1.77778	SMPTE, RGB
1280x720p @60	1.77778	SMPTE, RGB
1920x1080p @23.98	1.77778	SMPTE, RGB
1920x1080p @24	1.77778	SMPTE, RGB
1920x1080p @25	1.77778	SMPTE, RGB
1920x1080p @29.97	1.77778	SMPTE, RGB
1920x1080p @30	1.77778	SMPTE, RGB
1920x1080p @48	1.77778	SMPTE, RGB
1920x1080p @50	1.77778	SMPTE, RGB
1920x1080p II @50	1.77778	SMPTE, RGB
1920x1080p @59.94	1.77778	SMPTE, RGB
1920x1080p @60	1.77778	SMPTE, RGB
1920x1080sF@23.98	1.77778	SMPTE, RGB
1920x1080sF@24	1.77778	SMPTE, RGB
1920x1080i @50	1.77778	SMPTE, RGB
1920x1080i @59.94	1.77778	SMPTE, RGB
1920x1080i @60	1.77778	SMPTE, RGB
2048x1080p @48	1.8963	RGB
2048x1080p @50	1.8963	RGB
2048x1080p II @50	1.8963	RGB
2048x1080p @59.94	1.8963	RGB
2048x512p @59.94	4	RGB

Table A-10. ACS-2048 Input Formats (Continued)

Format	Aspect Ratio	Color Space
2048x1080p @60	1.77778	RGB
1920x1200p @60	1.77778	RGB
1920 x 1200 II @60	1.77778	RGB
1920 x 1080 II @60	1.77778	RGB, SMPTE
2048 x 1080 II @60	1.7778	RGB
Apple 1200p @60	1.6	RGB
875p	1.33333	RGB

B. Remote Control Protocol

In This Appendix

This appendix provides information regarding remote control protocol. The following topics are discussed:

- **Communicating with ACS-2048**
- **Command Protocol**
- **Error Codes**
- **ACS-2048 Command List**
- **Remote Commands**

Communicating with ACS-2048

- Use the following steps to communicate with the ACS-2048 via Telnet:

  1. Connect the ACS-2048's Ethernet port to an Ethernet switch, and connect the switch to your PC or laptop.
  2. Ensure that all Ethernet parameters are properly set up. In Chapter 4, refer to the "**Ethernet**" section on page 58 for details.
  3. For Telnet communications, use the ACS-2048's IP address and port 23. On a Microsoft Windows PC, open a command prompt window and enter the following:

     ```
     > telnet xxx.xxx.xxx.xxx  23
     ```

  4. After you "Telnet" into the ACS-2048, are are presented with the login prompt:

     ```
     Welcome to ACS-2048.
     Login as "user".
     Press <ENTER> for password.
     ```

     a. Type "user" and press **ENTER** to login.

     b. When prompted for a password, simply perss **ENTER**.

     Once you have successfully logged in, the following message appears, along with the command prompt (**>**):

     ```
     ShellApp waiting for input
     >
     ```

  5. You can now issue commands. Operationally, the telnet window functions in a manner similar to a serial communications session. As required, type "**help**" to see a list of supported commands.

Refer to the "**Remote Commands**" section on page 98 for a complete list of commands.

Command Protocol

The ACS-2048's command protocol is compatible with GNU getopt parsing. Every parameter of the command has an option character associated with it. A **<CR>** carriage return (**ASCII 13**) terminates the command.

Note The order of the option characters in the command does not matter.

▲ Command example:

```
ITYPE -i 2 -t 1<CR>
```

Or

```
ITYPE -t 1 -i 2<CR>
```

Command Responses

A command response is sent after each command is processed. This response consists of the command, followed by the error code, a line feed **<LF>** and a special termination character (**\x4**).

- When a command is successful, the error code is a **0** (**eERR_OK**), or some positive value.
- When a command is not successful, the error code is a negative value. A preliminary list of the error codes is included. Refer to the "**Error Codes**" section on page 96 for details.

▲ Command response example:

```
ITYPE -e 0<LF>
</x4>
```

Query Options

Query type options are available for the commands. The order of precedence for processing query option arguments is help (**--help**), query (**-?**), and list (**--list**). If more than one query option is sent in a command, the option with the highest precedence is processed, and any others are ignored.

Help Query — Commands have a "**help**" query option associated with them, (**--help**). This query lists all option flags and parameters for the command in the following format:

▲ Help option example:

```
IBRT --help<CR>
```

▲ Response:

IBRT

- **Description**: Input Brightness Adjust
- **Command Format**: IBRT -i(input) -b(bright)

- **Parameters**:

  -i(input): Input number, 1-8

  -b(bright): 75.0%-125.0%

- **Query Format**: IBRT i(input) -?
- **Query Response**: IBRT i(input) b(bright) --min 75 --max 125

  IBRT -e 0 <LF>

  </x4>

Current Setting Query — The current setting query option (**-?**) returns the command with each of the current parameter settings. Commands with minimum and maximum settings for the parameter will have these “min” and “max” values returned with option flags **--min** and **--max**.

- Query option example:

  ```
  IBRT -i 4 -?<CR>
  ```

- Response:

  ```
  IBRT -i 4 -b 100.00 --min 75 --max 125
  IBRT -e 0<LF>
  </x4>
  ```

Several commands have a list for the associated valid parameter values, such as the format commands. The list of these values can be queried with the list query option (**--list**). The list shows has the numeric value for the parameter, followed by the value text encased in quotes. A colon separates the numeric value from the string.

- List query option example:

  ```
  ISMP -i 4 --list<CR>
  ```

- Response:

  ```
  0:"OverSample"
  1:"1:1"
  ISMP -e 0<LF>
  </x4>
  ```

Error Codes

This section provides ACS-2048 error codes:

Error Codes: General Failures

The table below lists general failure codes:

Table B-1. ACS-2048 General Error Codes

Code	Description
-9999	Generic fail
-9998	Operation is not applicable in current state
-9997	UI Related... Did not get response from device
-9996	UI Related... Did not get valid response from device
-9995	Timeout occurred
-9994	Parameter / data out of range
-9993	Searching for data in a index, no matching data
-9992	Checksum didn't match
-9991	Version didn't match
-9990	UI Related... Current device interface not supported
-9989	Pointer operation invalid
-9988	Part of command had error
-9987	Buffer overflow
-9986	Initialization is not done

Error Codes: No Error

The table below lists the “no error” code:

Table B-1. ACS-2048 “No Error” Code

Code	Description
0	Successful

ACS-2048 Command List

The table below lists ACS-2048 remote commands.

Table B-1. ACS-2048 Remote Commands

Command	Description	Page
DHCP	Enable/Disable DHCP mode	98
IP	Set Static IP Address to be used when DHCP is OFF	98
SUBNET	Set subnet mask to be used when DHCP is OFF	98
GATEWAY	Set gateway to be used when DHCP is OFF	98
EMAC	Get MAC Address	99
AUTOACQ	Auto Input Acquisition Mode	99
ISEL	Selects the selected input as the current input to display	99
IHCROP	Input Horizontal Crop	99
IHPAN	Input Horizontal Pan	99
IVCROP	Input Vertical Crop	100
IVPAN	Input Vertical Pan	100
ICSAV	Saves Input Configuration	100
ICREC	Recalls saved input configuration for selected input	100
BLKVID	Puts black into the scaler selected	101
ORES	Output Resolution	101
OTPM	Output Test Pattern Mode	101
OTPT	Output Test Pattern Type	101
ORBM	Output Raster Box Mode	102
OMODE	Set the output mode	102
OGM	Set Output Gamma	103
OCSAV	Save Output Configuration	103
TRNTIME	Set transition time	103
VFDBRT	Set VFD brightness	103
AUTOSAVE	Auto Input Settings Save	104
SELMODE	Sets whether input selection of inputs w/o valid syncs will be made	104
CONTEXT	Sets menu context	104
TEMP	Query only command for the temperature of the unit	104
RESET	Reset unit	104
VER	Display Version info	104

Table B-1. ACS-2048 Remote Commands (Continued)

Command	Description	Page
SAVE	System Save	105
LOCKOUT	Controls the lockout mode of the front panel	105
ISTAT	Query only command for the input status type and format.	105
OSTAT	Query only command for the output status type and format	105

Remote Commands

This section lists ACS-2048 remote commands.

DHCP

- **Description**: Enable/Disable DHCP mode
- **Command Format**: DHCP -m (mode)
- **Command Params**: -m mode: 0-disable, 1-enable (default: on)
- **Query Format**: DHCP -?
- **Query Response**: DHCP -m (mode) --min 0 --max 1

IP

- **Description**: Set Static IP Address to be used when DHCP is OFF
- **Command Format**: IP -s (static)
- **Command Params**: -s static addr with format xxx.xxx.xxx.xxx
- **Query Format**: IP -?
- **Query Response**: IP -a (active addr) -s (static addr)
- **Response Params**: -a (active addr): returns active address

SUBNET

- **Description**: Set subnet mask to be used when DHCP is OFF
- **Command Format**: SUBNET -s (static addr)
- **Command Params**: -s static address formatted xxx.xxx.xxx.xxx
- **Query Format**: SUBNET -?
- **Query Response**: SUBNET -a(active addr) -s(static addr)
- **Response Params**: -a(active addr): returns active address

GATEWAY

- **Description**: Set gateway to be used when DHCP is OFF
- **Command Format**: GATEWAY -s (static addr)
- **Command Params**: s static addr: format will be: xxx.xxx.xxx.xxx

- **Query Format**: GATEWAY -?
- **Query Response**: GATEWAY -a (active addr) -s (static addr)
- **Query Params**: -a (active addr): Active gateway active address

EMAC

- **Description**: Get MAC Address
- **Command Format**: N/A
- **Command Params**: N/A
- **Query Format**: EMAC -?
- **Query Response**: EMAC -a (addr)
- **Response Params**: -a (addr): MAC address formatted xx.xx.xx.xx.xx.xx

AUTOACQ

- **Description**: Auto Input Acquisition Mode.
- **Command Format**: AUTOACQ -m (mode)
- **Command Params**: -m mode: 0-off, 1-on (Default: on)
- **Query Format**: AUTOACQ -?
- **Query Response**: AUTOACQ -m (mode) --min 0 --max 1

ISEL

- **Description**: Selects the selected input as the current input to display. This command will perform the valid sync check, route the input, recall video if saved or acquire source if not saved.
- **Command Format**: ISEL -i (input)
- **Parameters**: -i (input): 1 - 8
- **Query Format**: ISEL -?
- **Query Response**: ISEL -i (input)

IHCROP

- **Description**: Input Horizontal Crop
- **Command Format**: IHCROP -i (input) -w (width)
- **Parameters**:

  -i (input): 1 - 8

  -w (width): In pixels
- **Query Format**: IHCROP -i (input) -?
- **Query Response**: IHCROP -i (input) -w(width) --min (pos min) -- max (pos max)

IHPAN

- **Description**: Input Horizontal Pan
- **Command Format**: IHPAN -i (input) -p (pan)

- **Parameters**:

  -i (input): 1 - 8

  -p (pan): In pixels
- **Query Format**: IHPAN -i (input) -?
- **Query Response**: IHPAN -i (input) -p (pan) --min (active min) -- max (active max)

IVCROP

- **Description**: Input Vertical Crop
- **Command Format**: IVCROP -i (input) -h (height)
- **Parameters**:

  -i(input): 1 - 8

  -h(height): In lines
- **Query Format**: IVCROP -i(input) -?
- **Query Response**: IVCROP -i(input) -h(height) --min (pos min) -- max (pos max)

IVPAN

- **Description**: Input Vertical Pan
- **Command Format**: IVPAN -i (input) -p (pan)
- **Parameters**:

  -i (input): 1 - 8

  -p (pan): In pixels
- **Query Format**: IVPAN -i (input) -?
- **Query Response**: IVPAN -i (input) -p (pan) --min (active min) -- max (active max)

ICSAV

- **Description**: Saves Input Configuration
- **Command Format**: ICSAV -i (input)
- **Parameters**: -i (input):1 - 8
- **Query Format**: N/A
- **Query Response**: N/A

ICREC

- **Description**: Recalls saved input configuration for selected input
- **Command Format**: ICREC -i (input)
- **Parameters**: -i (input):1 - 8
- **Query Format**: N/A
- **Query Response**: N/A

BLKVID

- **Description**: Puts black into the scaler selected.
- **Command Format**: BLKVID -s (scaler) -m (mode)
- **Parameters**:

  -s (scaler): 1 - 2

  -m (mode): 0 - off, 1 - on
- **Query Format**: N/A
- **Query Response**: N/A

ORES

- **Description**: Output Resolution
- **Command Format**: ORES -o (output) [-f (format) | -n (index)]
- **Parameters**:

  -o (output): 1 - DVI

  -f (format): format string, i.e. "2048x1080 @60"

  (Default: 2048x1080 @ 59.94)

  or

  -n (index): video format index (see VHELP)
- **Query Format**: ORES -o (output) -?
- **Query Response**: ORES -o (output) -f(format)
- **List Format**: ORES -o (output) --list
- **List Response**:

  90:"2048x1080p @50"

  92:"2048x 1080p @59.94"

OTPM

- **Description**: Output Test Pattern Mode
- **Command Format**: OTPM -o (output) - m (mode)
- **Parameters**:

  -o (output): 1 - DVI

  -m (mode): 0 - off, 1 - on
- **Query Format**: OTPM -o (output) -?
- **Query Response**: OTPM -o (output) - m (mode) --min 0 -- max 1

OTPT

- **Description**: Output Test Pattern Type
- **Command Format**: OTPT -o (output) - t (type)
- **Parameters**:

  -o (output): 1 - DVI

-t (type):

- 1 - H Ramp
- 2 - V Ramp
- 3 - 100% Col Bars
- 4 - 16x16 Grid
- 5 - 32x32 Grid
- 6 - Burst
- 7 - 75% Col bars
- 8 - 50% Gray
- 9 - Gray Steps 1
- 10 - Gray Steps 2

- **Query Format**: OTPT -o (output) -?
- **Query Response**: OTPT -o (output) - t (type) --min 1 -- max 10
- **List Format**: OTPT -o (output) --list
- **List Response**:

1: "H Ramp"

2: " V Ramp"

3: "100% Col Bars"

4: "16x16 Grid"

5: "32x32 Grid"

6: "Burst"

7: "75% Col bars"

8: "50% Gray"

9: "Gray Steps 1"

10: "Gray Steps 2"

ORBM

- **Description**: Output Raster Box Mode
- **Command Format**: ORBM -o (output) -m (mode)
- **Parameters**:

-o (output): 1 - DVI

-m (mode): 0-off, 1-on

- **Query Format**: ORBM -o (output) -?
- **Query Response**: ORBM -o (output) -m (mode) --min 0 -- max 1

OMODE

- **Description**: Set the output mode
- **Command Format**: OMODE -o (output) -w (width)
- **Parameters**:

-o (output): 1 - DVI

-w (width): 0 - 8 bits, 1 - 10 bits, 2 - 12 bits (Default: 10 bits)

- **Query Format**: OMODE -o (output) -?
- **Query Response**: OMODE -o (output) -w(width) --min 0 -- max 2
- **List Format**: OMODE -o (output) --list
- **List Response**:

  0: "8 bits"

  1: "10 bits"

  2: "12 bits"

OGM

- **Description**: Set Output Gamma
- **Command Format**: OGM -o (output) -g (gamma)
- **Parameters**:

  -o output: 1 - DVI

  -g gamma: 1.0 to 3.0; +0.1 increment (Default: 1.0)
- **Query Format**: OGM -o (output) -?
- **Query Response**: OGM -o (output) -g (gamma) --min 1 -- max 3

OCSAV

- **Description**: Save Output Configuration
- **Command Format**: OCSAV
- **Parameters**: N/A
- **Query Format**: N/A
- **Query Response**: N/A

TRNTIME

- **Description**: Set transition time
- **Command Format**: TRNTIME -s (seconds)
- **Parameters**: -s (seconds): 1.5 - 5.0 (default: 1.5)
- **Query Format**: TRNTIME -?
- **Query Response**: TRNTIME -s (seconds) --min 1.5 -- max 5

VFDBRT

- **Description**: Set VFD brightness
- **Command Format**: VFDBRT -b (brightness) -f
- **Parameters**:

  -b (brightness): 1 - 16 (default: 10)

  -f: Command from front panel
- **Query Format**: VFDBRT -?
- **Query Response**: VFDBRT -b (brightness) --min 1 -- max 16

AUTOSAVE

- **Description**: Auto Input Settings Save
- **Command Format**: AUTOSAVE -m (mode)
- **Parameters**: -m (mode): 0 - off, 1 - on (default: off)
- **Query Format**: AUTOSAVE -?
- **Query Response**: AUTOSAVE -m (mode) --min 0 -- max 1

SELMODE

- **Description**: Sets whether input selection of inputs w/o valid syncs will be made.
- **Command Format**: SELMODE -m (mode)
- **Parameters**: -m (mode): 0 - don't allow selection, 1 - allow selection (Default: off)
- **Query Format**: SELMODE -?
- **Query Response**: SELMODE -m (mode) --min 0 -- max 1

CONTEXT

- **Description**: Sets menu context
- **Command Format**: CONTEXT -m (mode)
- **Parameters**: -m (mode): 0 - off, 1 - on
- **Query Format**: CONTEXT -?
- **Query Response**: CONTEXT -m (mode) --min 0 -- max 1

TEMP

- **Description**: Query only command for the temperature of the unit.
- **Query Format**: TEMP -?
- **Query Response**: TEMP -c (celsius) -f (fahrenheit)

RESET

- **Description**: Reset unit
- **Command Format**: RESET [-f | -s]
- **Parameters**:

  -f : factory reset

  Or

  -s: soft reset
- **Query Format**: N/A
- **Query Response**: N/A

VER

- **Description**: Display Version info
- **Command Format**: VER

- **Parameters**: N/A
- **Query Format**: N/A
- **Query Response**: N/A

SAVE

- **Description**: System Save
- **Command Format**: SAVE
- **Parameters**: N/A
- **Query Format**: N/A
- **Query Response**: N/A

LOCKOUT

- **Description**: Controls the lockout mode of the front panel. When enabled, the keys and menu will be deactivated.
- **Command Format**: LOCKOUT -m (mode)
- **Parameters**: -m (mode): 0 - disable, 1 - enable (default: disable)
- **Query Format**: LOCKOUT -?
- **Query Response**: LOCKOUT -m (mode) --min 0 -- max 1

ISTAT

- **Description**: Query only command for the input status type and format.
- **Query Format**: ISTAT -?
- **Query Response**: ISTAT -t "(input type)" -f "(input format)"

OSTAT

- **Description**: Query only command for the output status type and format.
- **Query Format**: OSTAT -?
- **Query Response**: OSTAT -t "(output type)" -f "(output format)"

C. Contact Information

In This Appendix

The following topics are discussed in this Appendix:

- **Warranty**
- **Return Material Authorization (RMA)**
- **Contact Information**

Warranty

All video products are designed and tested to the highest quality standards and are backed by a full 3-year parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. Barco warranties are only valid to the original purchaser/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modifications, lightning strikes, abuse (drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair. Barco will cover shipping charges for return shipments to customers.

Return Material Authorization (RMA)

In the unlikely event that a product is required to return for repair, please call the following number and ask for a Sales Engineer to receive a Return Merchandise Authorization number (RMA).

- (888) 414-7226

RMA Conditions are listed below:

a. Prior to returning any item, you must receive a Return Merchandise Authorization (RMA) number.

b. All RMA numbers must appear on their return-shipping label.

c. RMA numbers are valid for ten (10) days from issue date.

d. All shipping and insurance charges on all RMAs must be prepaid by the customer

Contact Information

Barco Media and Entertainment
11101 Trade Center Drive
Rancho Cordova, California 95670
USA

- Phone: (916) 859-2500
- Fax: (916) 859-2515
- Website: **www.barco.com**

Sales Contact Information

- Direct: (916) 859-2505
- Toll Free: (888) 414-7226
- E-mail: folsomsales@barco.com

Barco N.V.
Noordlaan 5
8520 Kuurne
BELGIUM

- Phone: +32 56.36.82.11
- Fax: +32 56.35.16.51
- Website: **www.barco.com**

Technical Support Information

- Tech Line: (866) 469-8036 — 24 hours per day, 7 days per week

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